

THE GEOGRAPHICAL MAGAZINE

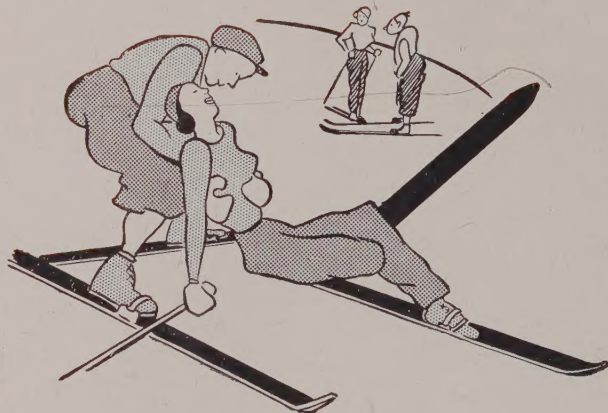
VOLUME VI, NO. 1

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Editor

Michael Huxley

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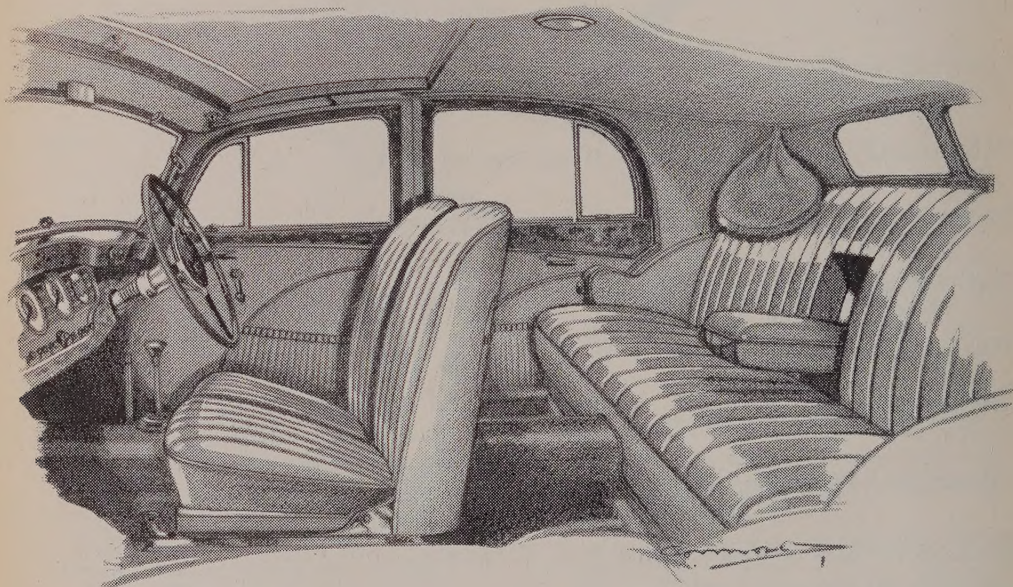
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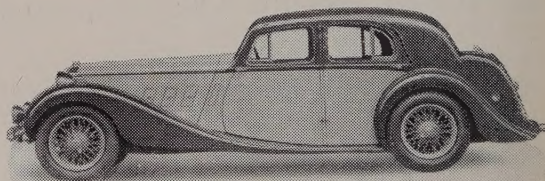
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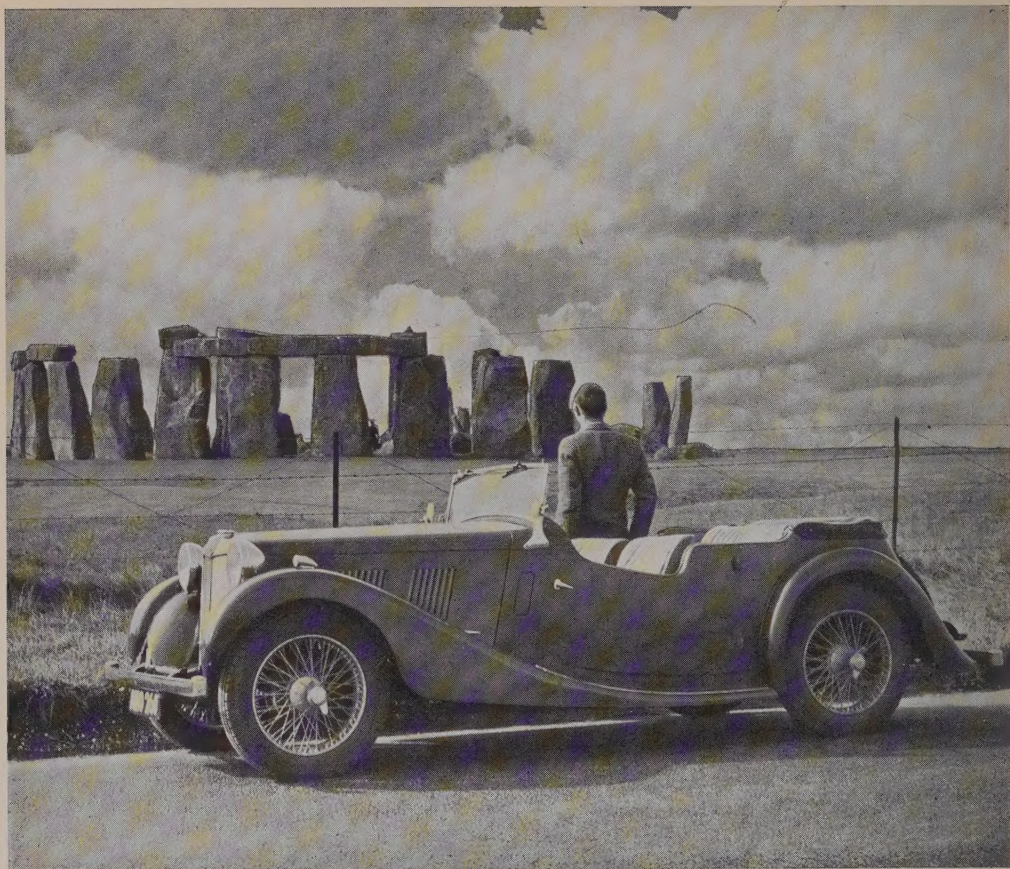
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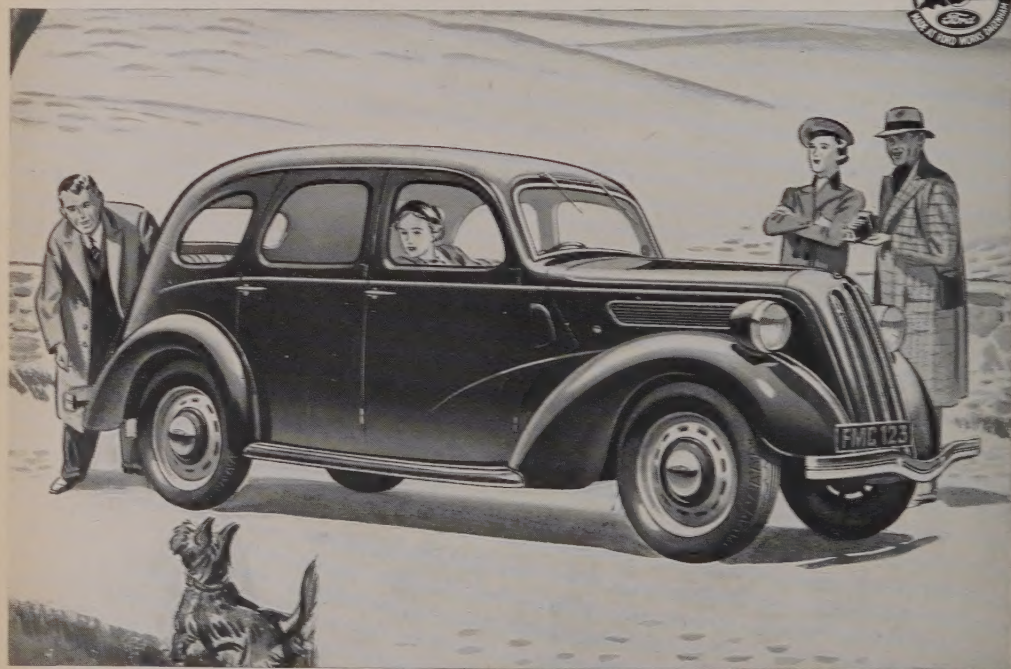
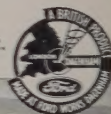
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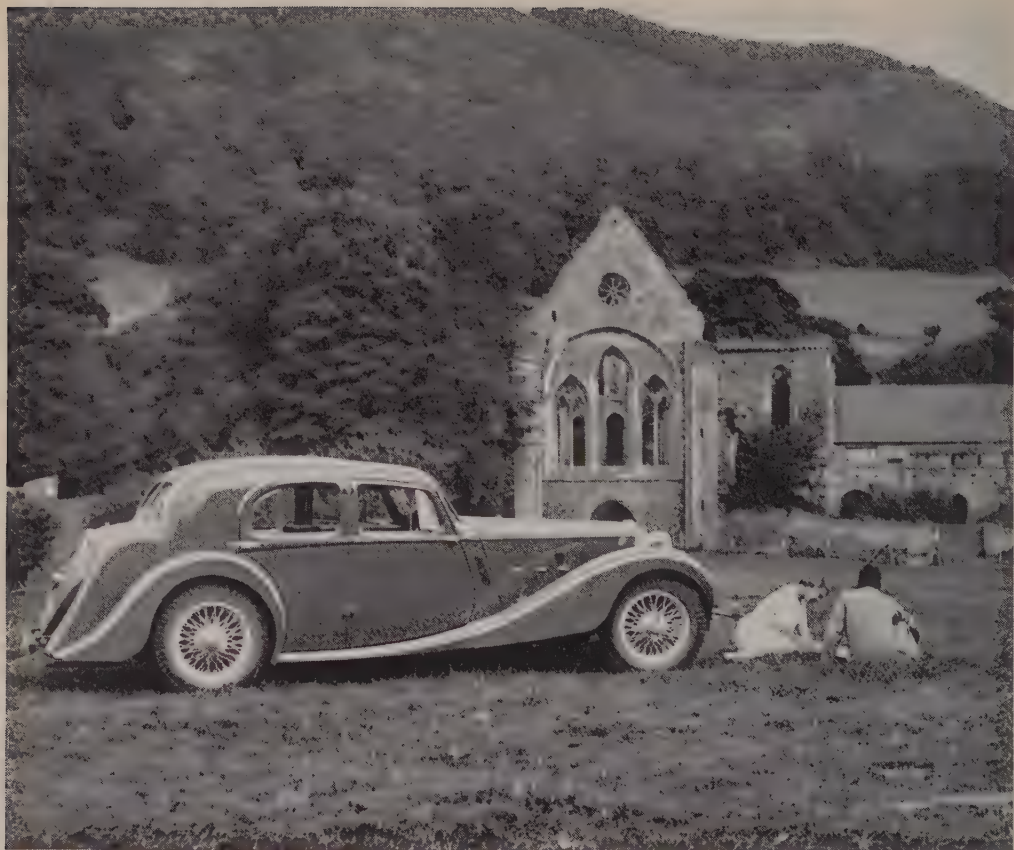
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The Galapagos Islands

by WOLFGANG VON HAGEN

The Geographical Magazine has given examples of geographical influences in literature and art: here is an example of a similar influence in science. As the New Zealand Alps to Samuel Butler or the Stour Valley to John Constable, so were the Galapagos Islands to Charles Darwin—the flash-point of a lifetime's inspiration. Dr von Hagen was the Director of the Darwin Memorial Expedition to the Galapagos in 1935

THE Galapagos, famous in the annals of natural history, comprise a group of nine large islands and a number of smaller ones all rather close together. They are situated on and below the equator, in the Pacific Ocean, 560 miles from the coast of Ecuador and a slightly greater distance south-west of Panama. Since the voyage of H.M.S. *Beagle* to the Islands in 1835, with the then youthful Charles Darwin on board, the Galapagos Islands have been closely associated with his memory and with the birth of his theory of evolution. But for three hundred years before the advent of the *Beagle* the Islands had been the gathering place of Spanish galleons, English privateers and whalers.

The islands were discovered in April 1535 by the Bishop of Panama, Tomás de Berlanga, when on his way from the isthmus to curb the power of Francisco Pizarro, *Conquistador de Peru*. The Bishop's ship came into the equatorial doldrums and, caught by the force of the strong Humboldt Antarctic current, drifted onto the islands. He found them uninhabited. Only after much difficulty could water be found, and then not before several men and animals had died of thirst. Later, in a communication to his Sovereign, the Bishop spoke of the tameness of the birds and 'large *Galapagos* [land tortoises] which can carry men on their backs'. The captain of the vessel made observations on the position of the islands which were included in the report. Later this report came into the hands of the agents of Abraham Ortelius, the 16th-century Flemish map-maker, who included the islands in his map of

Peru—*Peruviae Auriferae Regionis Typus*—executed in 1574. He called the islands *Isolas de Galapagos* in consequence of the story, contained in the report, of the giant land tortoises found there.

The discovery of the islands gave credence to legendary stories of a voyage of discovery made by the 11th Inca, Tupac Yupanqui, who was reported in the early 15th century to have visited volcanic islands in the Pacific, whence he brought back 'negro inhabitants', a throne of copper and gold, and skins of 'horses'. The Inca had named the islands *Nina-Chumbi* and *Hahua-Chumbi*. But no traces of aboriginal inhabitants have been discovered, and no metals, for the islands are of volcanic origin. Moreover, ancient Peruvian maritime traffic was carried on in large balsa rafts under crude sail. It is very doubtful if such craft could navigate the difficult waters of the Galapagos.





Howard Cleaves

The highly differentiated fauna of the Galapagos Islands—remote and geologically recent—presented Charles Darwin with a problem that impelled him to formulate his theory of the origin of species

Nevertheless, rumours of the two parallel discoveries, Inca and Christian, were responsible for a number of early Spanish voyages to the islands with disastrous results to the explorers. But the fame of the giant tortoises spread until Sir Richard Hawkins visited the islands in 1595. He was the first Englishman to do so, but he was unimpressed and in his memoirs laconically dismisses the tortoises in one line.

From 1640–80 the islands were frequently used as a haven by English pirates, and privateers such as Davis, John Eaton, Dampier, Sharpe and Cowley. It is to the last, William Ambrose Cowley, that many of the islands owe their English names. The largest of the islands were named after the Dukes of Albemarle and Norfolk. King James and King Charles, the Earl of Abingdon, Lord Culpeper and other colleagues of Cowley, some of whom I have failed to identify, were similarly

honoured. Later, in the 18th century, Captain Colnett inaugurated 'the golden age of whaling' in the Pacific, and on two occasions visited the Galapagos. He renamed some of the islands charted by Cowley and charted others that had been missed by that buccaneer. In 1831 the Republic of Ecuador annexed the islands, and renamed many of them in Spanish; so that two sets of names are current today, although the Spanish names are little known and seldom used.

Human occupation began in 1800, and was confined to two islands of the archipelago, so that when Charles Darwin arrived in September 1835, the islands were, for the most part, in their original state. With his mind already deeply impressed by the geological and palaeontological phenomena of South America, Darwin at once grasped the significance of the animal life on this group of islands.

He believed, and modern research has

to a great extent confirmed his belief, that the islands rose from the bottom of the ocean floor during a period of major eruptions, when the great volcanoes were active, before passing into a period of minor eruptions which built up the lesser craters. For on every hand Darwin found craters of primary, secondary and lesser degrees—fumaroles, cones and vents—all illuminating evidence of the volcanic action that shaped the islands. No matter where he might look, the youthful naturalist (he was then only 26) saw fresh flows of lava and broken bubbles of basalt that gave off a metallic clatter as he walked across them. The importance of his observations is reflected in his gradual awakening to the theory of evolution. For he naturally perceived that as the islands were geographically isolated and geologically recent, all the plants and birds, as well as the curious reptiles to be found on them, must have arrived by wind, wave and current. To us it appears as a foregone conclusion, but against the evidence of evolved species he had to take into account centuries of prejudice in favour of the doctrine of supernatural creation.

The reptiles he found to be all endemic species; none occurred on the South American continent, if one small snake that appeared to be related to a Chilean species were discounted. Sea iguanas were unique; the land iguana, that fed on cactus, had no near American relative unless the repulsive common iguana of the mangrove swamps in tropical America could be so regarded. The great tortoises he had never seen except in fossil fragments in Patagonia. The birds, though less spectacular, nevertheless fortified the suggestion that repeatedly presented itself to him; for although many of the species of birds were not found elsewhere, they all (like the flora) bore a remarkable likeness to specimens found on the American continent.

Although located on the equator, the islands were considerably cooled by the

cold Humboldt current that, coming northward, turned at the equator and moved due westward, bathing the islands in water as cool as 50 degrees. On the lower parts of the islands desert plants were found: opuntia cactus, acacia, mesquite and spined dry-leafed plants. Along the shore, wherever there were subterranean brackish water deposits, grew an attractive but poisonous tree, the *Mazanillo*—to be avoided like poison ivy. In the higher zones there was a great variety of plants, perennially green: larger trees, trailing vines, ferns and orchids. After the dry areas of Chile and Peru, Darwin found it the greenest bit of land that he had seen for some months.

The animals on this volcanic island, he reasoned, must be accounted for in one of two ways: either they were created simultaneously and specially for the islands, which would hardly be a reasonable conclusion as they resembled the American fauna; or, if they came to the island by migration, or were conveyed by the currents, one would find that while the animals were, in one sense, unique, they were constructed on the American plan of organization which would prove that they were descended from the continental fauna and differed only owing to long isolation. Not only that; in addition the fauna of each island differed, owing to the isolation of one island from another. This was apparent in the curious differentiation of the land tortoises and in the birds of the genus *Geospiza*.

Thus it came about that the studies of the great naturalist on the Galapagos, and the material he collected there, changed his career by stimulating him to consider the biological changes brought about by natural selection.

I visited the islands exactly a hundred years after the voyage of the *Beagle* and placed a small monument on Chatham Island, where Darwin first landed, in order to commemorate that event. I was fortunate in being able to stay six months and

in having facilities for visiting almost all the important islands, which have changed very little since Darwin's time. He found a small penal colony on Charles Island for political prisoners from Ecuador; it exists today, the only difference being that its members are now termed 'communists'. Darwin found at the base of Cerro de Paja, the large central mountain of that island, a series of remarkable caves, due for the most part to lava bubbles, which were first hollowed out by the early buccaneers and were, when he saw them, the homes of the political prisoners. Today the same volcanic crypts house political exiles.

On Indefatigable Island—named after a British frigate—we placed our small camp among families of Danes, Norwegians, Swedes, Germans, and even an Iclander—remnants of three unsuccessful 'agricultural colonies'. These Scandinavians carried on a bit of fishing and grew, on a small scale, products such as coffee, bananas, corn, tobacco, potatoes and squash; enough for their own wants.

As our visit was a long one we had unusual opportunities of observing the habits of bizarre reptiles and friendly birds. Histories of the islands contain many references to the presence of huge land tortoises ('galapagos' in Spanish) from which the archipelago gets its name. If the buccaneers could find no water, they found an abundance of fresh meat, and living tortoises could be kept on board ship for a long time. Originally very numerous—hundreds of thousands if the word of the buccaneers is to be believed—they were slaughtered in thousands and tens of thousands by visiting ships.

Save for a few giant land tortoises kept in zoological enclosures in the Seychelles group, the giant Galapagos tortoises are found in no other part of the world. A specimen secured many years ago by Lord Rothschild reached the weight of six hundred pounds.

When freshly hatched from the egg, which is exactly the size of a billiard ball,

the little galapago is not more than two or three inches across the shell and will weigh between two and three ounces. As growth, after the first five years, is only half an inch a year, one may conclude that a galapago, weighing six hundred pounds, must be from 175 to 200 years of age.

The galapago is a vegetarian. In captivity it will eat any green stuff: grass, bananas, papaya, etc. In its natural state it lives on the pads of the cactus. These provide it with water (80 per cent of the cactus is water) and a fairly high nutritive content of starch and sugar. In addition, it will occasionally eat leaves of other trees on the islands. It bestirs itself early in the morning, about 6 or 7 A.M., and at once begins to browse on the cactus.

The distribution of cactus differs on all the islands. At one point called Le Fe, on Indefatigable, we found cactus growing right down to the beach, where the groves grew on a level plain, replete with shady trees; here we found immense colonies of galapagos. Probably this is the only place in the entire archipelago where the tortoises are now found close to the sea. In Duncan Island, on the contrary, the cactus does not begin to grow until 1000 feet up on the lee-side of the island; it does, however, appear at a height of about 600 feet within the crater. So the galapagos are found relatively high there.

By noon, the galapagos will crawl under the shade of a tree, to eat again later in the day. When dusk falls, they retire permanently for the night, and if undisturbed will be found in the same place and position next morning. When sleeping they do not pull in head and legs, as is generally supposed. The head rests on the ground, the feet are spread out from the shell. Wherever their wanderings take them, they sleep, provided the place is cool and shady.

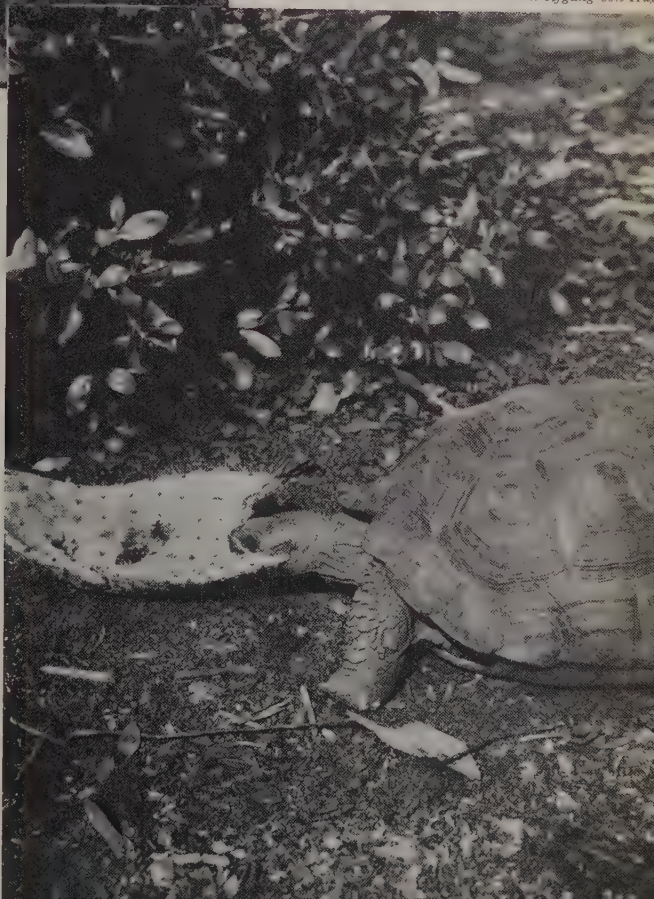
The utter monotony of this huge reptile's passage through life, knocking over trees which block its passage, extracting itself from volcanic cavities into which



Like the fauna, the flora of the Galapagos is extremely diversified and includes a large proportion of forms peculiar to the islands. On all of them varieties of the Opuntia family of cactus are found, the species and their distribution varying from island to island

Wolfgang von Hagen

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Cactus pads are the chief food of the giant land tortoises from which the archipelago derives its name, as well as of the land iguanas that are among its most distinctive curiosities. Man and the animals imported by him have already exterminated both creatures on some of the islands

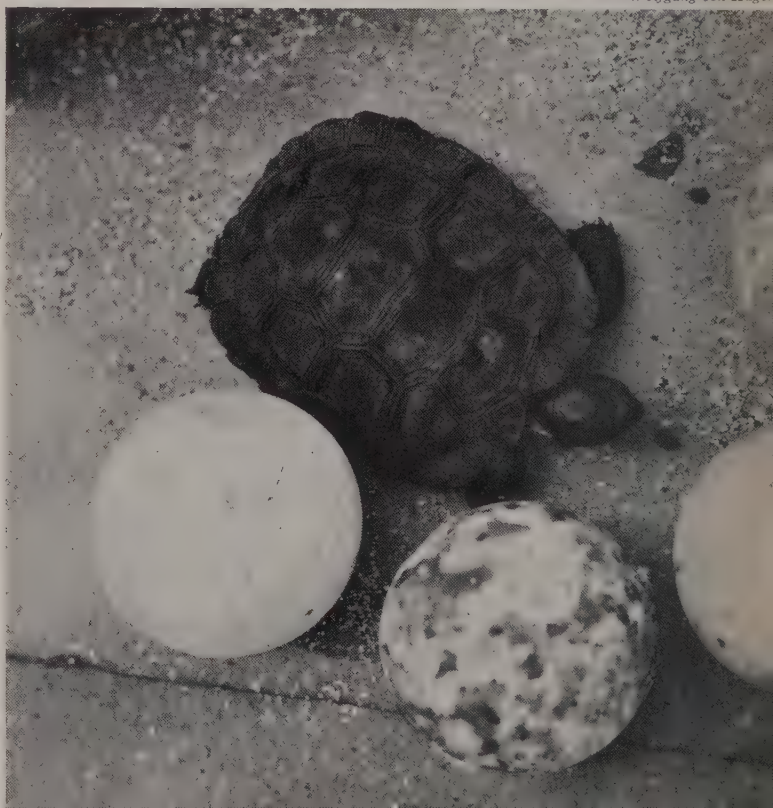


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The largest of the huge galapagos—seventy inches across the shell and six hundred pounds in weight—may be the oldest individual animals on earth

When hatched from an egg the size of a billiard ball, the little galapago is less than three inches across the shell and weighs less than three ounces



its natural clumsiness plunges it, is broken only by the migrations that accompany the mating season, from January to March.

Eggs are laid or incubated between October and January. We are not sufficiently acquainted with the habits of the galapagos to state definitely the type of habitat best suited to the eggs. I have found egg-caches at sea-level and at 600 feet above it, always in a porous sub-soil. The female hollows out the soil, undoubtedly excavating at various places until she finds a place sufficiently deep and not obstructed with immovable lava stones. Into a hole one to two feet in depth the eggs are laid. The hole is covered again with the excavated earth, upon which the female places fresh excrement; this forms a cement-like surface over the egg-cache. Hatching follows within a relatively short period. The little fellows must themselves bore their way out of this labyrinth, and I dare say that a meagre percentage of tortoises succeed in gaining egress.

Until the arrival of man, the galapagos had not had an enemy in the entire archipelago. Today, with wild pigs, wild dogs and donkeys in addition to man, the possibility of the tortoise arriving at maturity in its own habitat is very small. It has hardly a sporting chance.

When one lands on the Galapagos Islands, it is not tortoises that first meet one's eye, but large black iguanas, which Darwin called 'little imps of darkness'. They are the most ubiquitous of the Galapagos fauna, and are to be seen at all times of the day sunning themselves on the lava rocks that have tumbled into the sea. These reptiles are the so-called sea or marine iguanas, *Amblyrhynchus cristatus*. They are stocky, sullen-visaged creatures, and remind us of the period when the principal animals of the world were reptiles—the age of the monsters, when dinosaurs, plesiosaurs and other ancient reptiles peopled the earth.

The sea iguanas are jet black when young, this natural colouring blending

with the black basaltic lava rocks that are their home. So perfect is the camouflage that they are seldom seen until they rise up and flee, like leaves scurrying before the wind. Many of them are little creatures, six to fourteen inches in length from the nose to the tip of the tail. They will run ahead of you a little way, and when they feel they are at a safe distance, they pause, head erect, extremely dignified, and blow from their nostrils a fluid that evaporates like spindrift in the air.

The larger iguanas usually rest during the midday heat among the salt-water succulents that grow on the shore. If we walked among these bushes, we would as likely as not tread upon them. The males measure from forty to sixty inches in length, and are repulsive in appearance, yellow in colour, spotted with orange and black. They shake their heads threateningly at a human being's approach and their open mouths reveal rows of sharp coral-shaped, tricuspid teeth and a small reddish tongue.

The hind feet of the reptiles are slightly webbed, yet they are not used for swimming. When one of them enters the sea, the four legs are folded tightly against the body and it becomes as streamlined as the newest ocean liner. Thus, the animal makes off through the water, plying its long thin tail, the only motive power. The tail is broad and longer than the body, and the entire length of the back, from head to tail, is ridged with spines. Iguanas apparently are immune from the attacks of fish, as they freely cross wide stretches without apparent fear. These swimming excursions are most noticeable at Academy Bay, Indefatigable Island, where we made our headquarters.

When the tide ebbs, masses of algae are exposed on the rocks, and here the iguanas gather for their daily feed. They clutch the lava rocks with their sharp claws and vigorously tear away the weeds with their teeth.

At the beginning of 'winter', from



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Though the sea iguana reaches a length of five feet, and is of ferocious aspect, it is a harmless creature, living on seaweed. It propels itself through the water with its tail



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The sea iguana's hind feet, though slightly webbed, are not employed for swimming



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The land iguana, on the other hand, uses its powerful jaws for attack as well as for tearing cactus: not, however, for chewing, so internal fluids must do the work of digestion



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With its armoured claws it digs its burrow and scrapes thorns from cactus pads

November to February, the female lays her half-dozen or so eggs, burying them in sandy slopes to a maximum depth of twenty inches. The eggs measure about fifty millimetres in diameter and about seventy-six in length, and have a tough pliable shell. They do not take long to hatch, and the young soon take their places with the rest of the colony.

In appearance and structure the common Galapagos land iguana, *Conolophus subcristatus*, differs from its immediate relative, the sea iguana. Its tail is shorter and not as essential to its progress as is that of the semi-amphibious *Amblyrhynchus*, for it has no need to swim. The head of the land iguana is longer and wider, with the snout rather pointed, and the body is heavier. It lives in a deep sloping burrow, and its food is entirely vegetable: cactuses, as well as grass and the foliage, flowers and berries of various plants.

Unlike the sea iguana the land species is somewhat vicious and will bite. Yet, correctly handled, it is harmless. Capturing specimens is rare sport.

Our native servant, Turvino, was an old hand at the game. He would pursue the creatures up the hills, through the bushes, under huge cactus trees; the iguana seeking a hole, a fissure in the rocks, and the pursuer trying to keep so close behind him that he will not be able to make up his mind to dart into a crevice. Eventually the iguana stops and turns breathless in its tracks, its sides heaving. With open mouth it defies its pursuer. At this moment one sees a practical illustration of the phrase 'with blood in his eye.' The eyes of the pallid iguana turn from a light grey to blood red; so red that one expects blood to be ejected in the manner of the Arizona horned lizard. But once cornered the land iguana is easily captured. Swiftly one reaches behind to get it by the tail, the open mouth snaps on the empty air, Turvino runs up with the bag and the creature is placed inside.

Desiring to observe their habits, we

placed a number of them in a large cage, in more or less natural conditions, and soon we were rewarded in seeing them mate and in being able to photograph their egg-laying.

Although the Galapagos Islands are only 560 miles from the steaming jungles of Ecuador, the avifauna is not wholly neotropical; on the contrary, many of the sea birds indigenous to the islands are found as far south as the Antarctic. Albatrosses, penguins, flightless cormorants, frigate birds, herons and gulls are among the marine birds of the islands. The albatross nests only in Hood Island, which appears to be the most northern habitat of a bird commonly associated with Tierra del Fuego. The penguin's presence on the islands can be readily understood, as the Humboldt current sweeping northward carries much of the type of sea food on which it lives. Besides, a near relative of this penguin — *Spheniscus mendiculus* — is found on the coast of Peru.

Not so easily explained, however, is the presence of a flightless cormorant whose wings have degenerated into useless appendages. It lives on the western side of Albemarle in the colder water, and exists side by side with the marine iguana, with which it is very friendly; it is not at all uncommon to see the two species in considerable numbers gathered in the midday sun, the iguana lying on the hot lava rocks, the cormorant stretching its ridiculous atrophied wings in the sun to dry.

The small drab finches and mocking-birds which abound supplied Darwin with one great stimulus in considering the methods by which species evolve. He found that the little finches varied not only from island to island, but even on the same islands there were considerable variations in the beak of the bird, which led him to consider over and over again the problem of variation in animals.

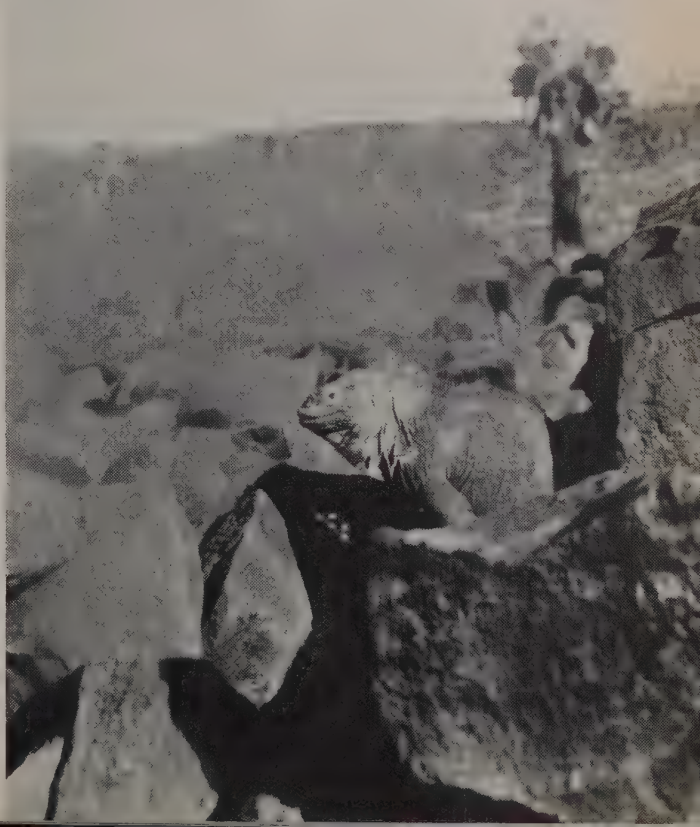
Scattered among the coastal lagoons on some of the islands—James, Albemarle,



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Although a battle of male land iguanas may at first recall some scene of the age of the dinosaurs, their tactics include characteristics both of cock- and stag-fighting. They are seen above in the first stage: moving their heads threateningly up and down. In the next stage they ram their heads together in the manner of horned beasts. The rest of the combat consists in the creatures pushing each other back and forth



Like a contemplative fiend an old male iguana gazes over the volcanic landscape of Seymour Island



Howard Cleaves

Wolfgang von Hagen



*A species of albatross, *Diomedea irrorata*, is indigenous to the archipelago, nesting only in Hood Island*

The flightless cormorant—an outstanding example of wing degeneration—is found only on Albemarle and Narborough Islands, and escaped the notice of Darwin. It lives in perfect harmony with the sea iguanas

A young frigate-bird, with the brown adult plumage beginning to grow through the white down



The frigate-bird, whose immense wing-span enables it to soar effortlessly, has undergone an opposite kind of degeneration—that of the legs and feet, which are weak and almost useless

Howard Cleaves



Howard Cleaves

Charles, Indefatigable and Jarvis—there are flocks of flamingo which, with the exception of the vermilion fly-catcher, supply the only note of colour in the bird life of the Galapagos. This flamingo is the same species—*Phoenicopterus ruber*—as that found in the Bahamas, and the colony is the only one that exists on the Pacific side of the American continent. Each island where there are lagoons has its own contingent of flamingoes.

We started for James Island one day in our small sloop, but three miles south of James we sighted the isle of Jarvis. The whole island is not more than three miles in diameter and might easily be swallowed up in one of the many craters of Albe-marle. Up a shallow bay on the leeward side of the island our little sloop nosed her way. Before us the sand of the beach



A flamingo chick photographed in the act of emerging from its shell (see page 16)

Wolfgang von Hagen

stretched away on either side like a broad ribbon of a beautiful beige colour. We had seen nothing like it on other islands. The sun was still low in the east and the last delicate clouds of mist were rising, like steam from a plum-pudding, from the top of Jarvis mountains. The beach three or four yards from the water was covered with succulent green vegetation that invited investigation, and we lost no time in going ashore.

Eagerly, and with extreme stealth so as not to disturb any inhabitants, we made our way through the green verdure. An exclamation of my wife's brought me to her side, and, parting the screening bushes, I espied the cause of her excitement: in a small salt pond a score of flamingoes paraded slowly by. The birds, three feet in height, were foraging for little salt-water molluscs, some of them moving along with their heads entirely below the surface of the water so that only a roseate sphere was visible. The pond with its gently rippling surface was surrounded by giant cactus trees, and with the mountains rising a thousand feet behind it, seemed like a bit of fairyland transported to the rugged Galapagos. On a small lava hill we saw a conical mud tower, and in the gentle hollow on its top, an egg. On drawing nearer we discovered tower after tower—the flamingo rookery, containing almost a score of eggs in the process of being hatched. While my wife filmed the panorama of the rookery I busied myself with the study of one of the towers. As I carefully turned an egg in order to secure a better picture I was startled by a protesting chirp from within. Simultaneously a bit of shell was chipped off.

Setting the cameras in focus, we awaited the flamingo's debut into the world. An hour, two hours, and the hole was scarcely larger than a five-cent piece. Then it occurred to us that the mother bird might normally assist in releasing her offspring. And even if she didn't our patience was not entirely inexhaustible. So I decided



A flamingo rookery on Jervis Island, showing the nests—conical towers of mud

Wolfgang von Ha

to play midwife to the embryo flamingo.

For instruments in this accouchement, I had only my forceps, but they proved to be quite the correct thing. Bit by bit the egg was broken, and either from distress, or encouragement, our charge within the egg gave periodic chirps. We had to go slowly as the bird could not be expelled quickly but had to adjust itself to his new aerial environment. I would stop occasionally to photograph the process, and allow the contortions of the little flamingo to break away part of the egg also. At last we were rewarded in seeing the bird eject itself from the half of the shell that remained. With a final chirp, it shook off the bits of shell adhering to its feathers and, white as a ball of cotton, lay on the conical earth mound.

Yet all the zoological interest of which I write must be searched for carefully. Wild life does not exist now, as it once did, unmolested on all the islands. The great land tortoises are extinct in five of the islands; the land iguanas are approaching extinction; the flamingoes are being killed by natives for food and carried away by yachtsmen; other birds are suffering in like manner. Laws were passed in May 1936 by the Government of Ecuador, to whom the islands belong, in a belated attempt to save the fauna, and it is

pleasant to record that British science is taking the initiative in assisting to preserve it. For the Galapagos Islands are intimately bound up with English history and British science. It was, after all, British seafarers who named the islands. It was an English captain, Colnett, who first pointed out the existence of the whaling grounds and paved the way for further discoveries. It was Captain Robert Fitzroy who made the first correct chart of the islands on which all subsequent charts are based, and finally it was Darwin who first gave to the world a knowledge of the unique fauna to be found there and supplied the impetus for other British students to visit the islands or write about the collections made on them.

Wallace, Gunther, Lord Rothschild, Salvin, to mention but a few naturalists, have nobly advanced our knowledge of this, one of the most important fields of study in the world. It is to be hoped that the Galapagos Committee of the British Association for the Advancement of Science, on which Lord Moyne, Sir Edward Poulton, Professor Salisbury, Dr Julian Huxley and others serve, will be successful in creating some form of protection for the species of the islands, which gave Darwin a great part of the inspiration for his great work on the theory of evolution.



Photographs by A. Costa

On a colossus at Memphis appears the royal hieroglyph of Rameses II (13th century B.C.)



From end to end of Egypt, in temples far up the Nile, as at Sebû'a in Nubia —



— and in the Ramesseum at Thebes, the splendour and vanity of Rameses II are perpetuated



Like Rameses II, subject of the gigantic figures at Abu Simbel, the Pharaohs down the ages —



— recorded their fame in temples and tombs. The Hawk of Horus at Edfu (3rd century B.C.)



Those that have no memorial : descendants of a hundred generations of slaves and peasants —



— from whose labour the Pharaohs drew the wealth to support their architectural extravagance



Later rulers also raised grand monuments. Restoring one of the 'Caliphs' Tombs' at Cairo

Avantika

'Ayodhya, Mathura, Maya, Kashi, Kanchi, Avantika,
Dwaravati chaiva, saptaite Mokshadayika'
—These seven cities have the gift of Moksha.

by STAN HARDING

The sacred cities of India are so bound up with the Hindu faith that in describing one of them Mrs Stan Harding necessarily uses terms of Hindu theology with which some readers may be unfamiliar. In order that these may not be encountered without previous introduction it may be stated briefly that the Hindu trinity consists of the three forms in which Brahmā, the Universal and Supreme Being, is manifested: the first, Brahmā the creator; the second, Vishnu the preserver; the third, Siva the destroyer. Vishnu and Siva, the favourite gods of the Hindus, have, again, many forms: Krishna, for instance, is one of ten incarnations, or descents, of Vishnu, whose followers are known as Vaishnavas. Siva, who as Mahadeva, the 'great god', is worshipped as creator and preserver as well as destroyer, is symbolized by an emblem of which the twelve most famous examples are called Jyotir Lings. The Mahakal temple at Avantika contains one of these

Of the seven sacred cities which the orthodox Hindu invokes in his daily devotions and believes to have the gift of *moksha* or 'liberation' perhaps the least known to the world at large is Avantika (called 'Ujjain' since the beginning of the Christian era). Yet few cities have a legend of greater splendour or a past of comparable antiquity. Hindu belief in the fabulous age of this place is expressed in its name. 'Avantika' means the 'Seed City', so called because the germs of all living beings are supposed to have survived the Flood preserved in the central image of Mahadev in the great Mahakal temple.

Situated on the Malwa Plateau, 1745 ft. above sea-level, Avantika marks the first meridian of Indian geography. The meridian traverses its famous observatory, then the image of Siva in its great Mahakal temple and, passing the near-by temple of Devi, crosses the sacred Sipra river between the terraced embankments, the Ramghat and the Hariharghat.

Tradition endows Avantika with three thousand years of glory in the days before recorded history. It is the beloved city of the poet Kalidasa who sang its golden spires, learned Brahmins and beautiful women. In historical times it is famous for its association with the great Indian monarchs, Asoka, Vikramaditya, Chandra-

gupta and Akbar. Repeatedly captured and sacked, Ujjain has been twice completely destroyed, once by flood and once by Altamsh, King of Delhi. It has been in turn the capital of a Brahminical, a Jain, a Buddhist, a Scythian, a Hindu, a Greek, a Mogul and at length again a Hindu State, until Maharaja Daulat Rao Scindia of Gwalior moved his capital to Lashkar in 1810.

The orthodox Hindu belief in the immense antiquity of Avantika, perhaps the most ancient of India's sacred cities, finds some endorsement in modern archaeological research which has been looking



Stanford, London.



Photographs by Stan Harding

The Sipra, the sacred river from which, above all, Avantika derives its renown, is lined with temples, 'choultries' or shelters for pilgrims, and bathing 'ghats' where they may partake of its blessing

for the relics of the pre-Flood era not far distant, in the Narbada valley, believed by many to have been the cradle of human life on earth. One of the Sanskrit names for the place, Pratikalpa, means 'coeval with creation'.

In its legendary past Avantika was renowned as a seat of learning. According to the Shastras, the ancient Indian textbooks, it was to this place rather than to Benares that Sri Krishna, an avatar of Vishnu, and his brother Balaram were sent to study at the feet of their teacher, Sandipani. The site of the teacher's hermitage (Guru's ashram) is a famous place of pilgrimage and has a small temple and a charming pool. This place is known as Ankpat and many Vaishnavas make a pilgrimage to it once in life. The celebrity of Avantika as a place of Sivaite pilgrimage is perhaps even greater, for the famous temple of Mahakal enshrines one of the twelve

'Jyotir Lings', and is consequently one of the twelve most important centres of worship for the many millions of Sivaite devotees throughout the country.

In 1235 this temple was wrecked by Altamsh, who carried off to his capital the famous gem-studded idol of Mahakal from which according to Sivaite belief the world was restocked after the Flood with human, animal and plant life. The temple now standing was rebuilt on its ancient site by Ramachandra, Dewan to the head of the Mahratta Confederacy, five hundred years later. So great is the concourse of pious visitors that more than a hundred *pandas* (Brahmin priests, who act as guides and spiritual advisers to the pilgrims) are required to assist them at their devotions.

It is worthy of note that Siva is worshipped in this temple as Mahakal, Lord of Great Time—'of Eternity', as we might say. In this connection it is significant that



The first meridian of Hindu geography crosses the river from the Ramghat (above) to the Hariharghat



Avantika's ancient fame as an astronomical centre was renewed in the 17th century by the construction of Maharaja Jai Singh's observatory, the Yantra Mahal, which the meridian also traverses

Avantika has been famous as a centre for the determination of time since the epoch of legend, and was reputed as an astronomical and astrological centre at the time when Sri Krishna studied at the hermitage of his teacher. The Vikram Era, which still obtains in Hindu India, and which will complete its second millennium in a few years' time, dates from Vikramaditya, legendary ruler of Avantika. The present observatory, the Yantra Mahal, was built by Maharaja Jai Singh in 1693, after the Hindu Renaissance, and has a number of astronomical instruments constructed in masonry. The triangular wall points due north and south and is so inclined as to be parallel to the axis of the earth. The quadrants point due east and west and are engraved with hours, minutes and subdivisions of minutes so that the shadow of the wall falling on these indicates apparent Solar Time.

Since time immemorial pilgrims to the shrine of Mahakal have bathed at the Ramghat, some seven or eight minutes' walk from the temple. Modern engineering sees to it that water is not wanting at the Ramghat and the Hariharghat. Everything possible is done to preserve from pollution the sacred river from which, above all, the fame and virtue of Avantika derive. For instance, the use of soap is prohibited: for the water of the Sipra, of which all Hindu bathers take a ritual sip, must not be contaminated by soap-suds—which might also be displeasing to the sacred turtles which play an important rôle at Avantika.

Since the days of Asoka, the Buddhist emperor who ruled almost the whole of India in the 3rd century B.C., Avantika and the surrounding country within a five-mile radius have been a sanctuary for all living creatures. The fish and the turtles of the

Sipra river have been under the special protection of successive Buddhist, Jain and Hindu dynasties. Notices prohibiting hunting and fishing are everywhere in evidence between Triveni and Kaliadeh, which mark the limits of the ten-mile stretch of sacred river above and below Avantika. In consequence the banks of the Sipra are haunted by wild peacocks and many other birds, and the waters of the river here probably show more turtles to the square yard than may be found anywhere else in the world—except at some similar Indian sanctuary. The Sipraghats of Avantika and of the neighbouring Sidhnath are besieged by turtles, which repose full confidence in their non-aggression pact with man. It is safe to say that if this pact is infringed the aggressor is the turtle. Let it be confessed that he is not as strictly vegetarian as the pilgrim—and is apt to take an occasional nip at any swimmer who forgets to keep moving!

There is no more popular form of well-doing than the spending of a few pice or a few annas on behalf of the turtles, which thoroughly appreciate the good gifts offered by pilgrims and residents. Many Ujjain residents set aside one afternoon a week on which they resort to the river banks with a large brass tray and a quantity of flour, which they knead into a dough much appreciated by the turtles. They sit beside the river at noon or sundown and feed this to turtles and kites, for the kites of Avantika are also invited by residents and pilgrims to share the benefits of this sacred place.

On feast days immense quantities of hay and other fodder are brought down to the river and there purchased by the pilgrims and offered to the herds of liberated cows and sacred bulls that wander ownerless through the city. Small circular stone basins are built along the river front and one may see the pilgrims filling these from the river for the greater convenience of the cows. Many a cultivator brings his own cows to the river, that both they and he may

benefit by the generosity of the pilgrims. Shrewdly, he brings at the same time a quantity of his own hay: the pilgrim, in an expansive mood after his bath, looking for cows to feed, and for something to feed them with, buys the cultivator's hay and feeds the cultivator's cows—a truly satisfactory arrangement, even if his cows breakfast a little later than usual.

The unowned cows here are fortunate, for a uniformed official, wearing the badge of his office, collects alms on their behalf. He strolls up and down the river front



But it was through the central image in the Mahakal temple, where Siva is worshipped as 'Lord of Great Time', that the early Hindu astronomers drew their meridian



The quality of a Tirtha or divine water is shared by the Sipra with other Indian rivers; its claims in this respect may, however, be judged by the fact that at the twelve-yearly festival of the Simhast, when its maximum blessing is conferred, Avantika attracts 12,000,000 pilgrims

The ritual bath, taken at dawn, at noon and at eventide, is thus an essential part of the pilgrim's devotions, and the State authorities of Gwalior make every effort to preserve the physical purity of the river, whose waters all religious bathers sip. The use of soap incurs a reprimand



calling, "Protect the cow! Protect the cow!" Many a pilgrim likes to offer his gift of sweets or grass direct to the recipients, and the cows seem to appreciate the personal touch.

Three of the great annual festivals of Avantika take place on the Sipra banks (a fourth, Mahasivaratri, has the shrine of Mahakal as its centre). The Sipra river is accounted a surpassing *Tirtha* (literally 'divine water') whose waters bless, redeem, make happy and victorious all who bathe in them with due rites. It is most specially sacred at the Ramghat, which may be counted a *Mahatirtha*, i.e. a supremely sacred watering-place.

The maximum blessing of this river is believed to be conferred at the festival of the Simhast, which takes place once in every twelve years, when Jupiter enters the sign of Leo and the seven sacred rivers are said to enter the Sipra. At the time of the Simhast, this ancient Avantika again becomes a magnet for many millions, and the railway handles twelve lakhs of pilgrims (12,000,000) among whom are usually some 60,000 'wandering ascetics' or *sanyasis*.

The Sivaite sanyasis camp in their thousands on the left bank of the river and the Vaishnaivite in their thousands along the right bank in the neighbourhood of Ankpat. Usually this army of wandering ascetics makes a stay of six weeks at Avantika; for the first three weeks they are the guests of the Maharaja of Gwalior and for the next three they are entertained by the wealthy townsmen of Ujjain. Many of them come in groups under the leadership of a Mahant, or spiritual chief. These chiefs are received by the Maharaja's officers, who ascertain the number of their disciples and distribute food and firewood accordingly. If in some particular instance there is reason to believe that the number of disciples has been exaggerated, no questions are asked; open-handed generosity to these wanderers is the rule of the Raj at this time. Many members of these groups be-

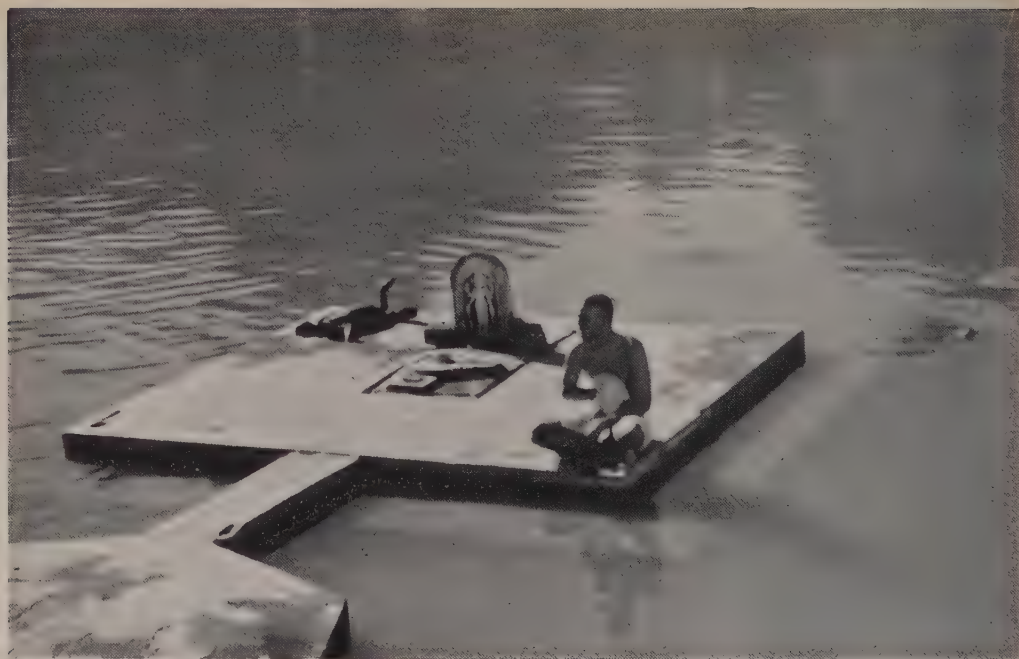
long to fighting orders and belie their name of *Sadhu*, which means 'a quiet man'. Clashes are not infrequent between Sivaites and Vaishnaivites, so police are detailed in force to prevent such occurrences.

On the great day of the Simhast, the Ancient Order of Naked Ascetics, whose red-walled monastery dominates the river opposite the Ramghat, recovers for a brief moment something of its former importance. According to the immemorial order of the day, the ancient banner of the Naked Ascetics is first dipped in the river, then the Mahant of the Order enters the river for his ritual bath. The Maharaja follows suit and does reverence to the Mahant. The deep respect shown by the reigning house of Gwalior to the Mahant of the Naked Ascetics is in accordance with infinitely ancient tradition which affirms that Vikramaditya himself received his throne from his elder brother, who forsook it to become a Naked Ascetic, and who also lived as such for long years beside the sacred Sipra. Next in order, the 60,000 wandering ascetics, followed by the remaining 12,000,000 pilgrims, enter the river.

It will be seen that this is the Sipra's busy day!

Avantika is one of the four chief centres of the Ancient Order of Naked Ascetics. This Order was founded in dim antiquity on behalf of Hinduism to fight the progress of Jainism, whose bands of naked *sramanas* (wandering Jain ascetics) roamed all over India, spreading the Jaina faith, and impressing the 'average sensual man' by the savage severity of their asceticism and the completeness of their destitution, which did not permit the possession of even a rag of clothing. Their accent on non-violence towards all living beings made a nostalgic appeal in a cruel age.

On the principle that like cures like, Hinduism opposed to these wanderers naked ascetics of its own. The Order at Avantika was a fighting order, and its headquarters is still called an *Akara*, that is, a school of physical training for fighting



For over 2000 years the country round Avantika has been a sanctuary for all living creatures, and the Sipra swarms with turtles that sun themselves on the bathers' platforms



To feed these strange creatures is a popular act of piety. Besides the turtles—



—the kites that wheel above the temple spires also receive offerings from the devout



The Ranaji choultry affords shelter to sanyasis or wandering ascetics all the year round

men—a school of the type which existed when war was a series of single combats, waged with swords, clubs, battle-axes, and many more curious and unusual weapons. The Akara possesses a great collection of these, and some of its members can still do a very creditable sword-dance.

Nowadays observance of the first rule of the Order, that is, the rule of complete nakedness, seems to have become almost optional. Some wandering members of the fraternity who returned to headquarters at the commencement of the summer rains were *nirvani*—‘sky-clad’, i.e. quite naked. If one visits the Akara, however, on a chilly morning one will see, in addition to the merely ‘sky-clad’, ascetics clothed in a curious collection of shawls and other wraps, even occasionally a knitted jersey of Western design, worn without special reference to conventional ideas of covering the body. The position seems to be that strict adherence to the rule is held to be commendable; on the other hand, compromise is admitted to be convenient and will not be censured. Only on certain ceremonial occasions there must be no compromise. The spiritual head of the Order explained to me emphatically that “We ARE naked in our bath”.

The Westerner will probably see nothing at all unusual about this, but as the Hindu bath is traditionally and generally taken in a river or a pool, or by a well-side in a public place, absolute nudity is almost as rare among bathers as by the Serpentine. But the Naked Ascetic has to draw the line about clothes somewhere and he draws it here. He at least, is still naked in his bath—which, of course, is a religious rite—and also on other ‘full-dress’ occasions: at some religious ceremonies, such as collective pilgrimages to the source of a sacred river. If these take place in British India, as distinct from the Native States, the police require them to be performed before six o’clock in the morning, or alternatively the *Nanga Sadhu*—naked ascetic—must be

surrounded and hidden from public view by disciples who have not yet taken vows, and who wear a minimum of clothing.

During the monsoon the Akara is visited by large bands of fellow-members of the Order from other parts of the country, who sometimes arrive with camels and oxen, tents and other communal property. When the Akara is full, the summer visitors take up their residence on the surrounding hillside. Some of these belong to the contemplative side of the Order which has a monastery in Mysore. Their voices swell the male choir, singing songs in praise of the Gods till late at night. Three times daily they bathe at the Hari-harghat and swim the sacred river, and their cries of “Ganga! Gangae! Ganga Hara!” (Ganges! O Ganges! O Ganges Goddess!) resound from long before sunrise till after sundown.

The members of the Order are for the most part very simple folk. One of the brethren, who spoke English fluently, had been to New Zealand as a ship’s steward; there he had met the Scottish missionary lady who guided his first steps on the religious path which finally led him to the red-walled Akara of the Naked Ascetics. Possibly she would have been surprised to receive a photograph of him in the full dress of his Order, leaning like Hercules on a massive club. . . .

A novice of the Order who lived in an attractive little hermitage just outside the Akara while undergoing instruction from the Mahant, was of a different calibre. He was, I learned, an ex-Punjab official of high standing who, on reaching retiring age, had decided to join the Order. After his initiation at Avantika he journeyed, I believe, to the Mysore Mutt. (‘Monastery’ is an appropriate translation of the word.)

There is a very great disparity between the mental and moral qualifications of the innumerable wandering Sadhus, who at the time of the Simhast resemble an army of occupation, and who at all times, but particularly during the rains, are to be



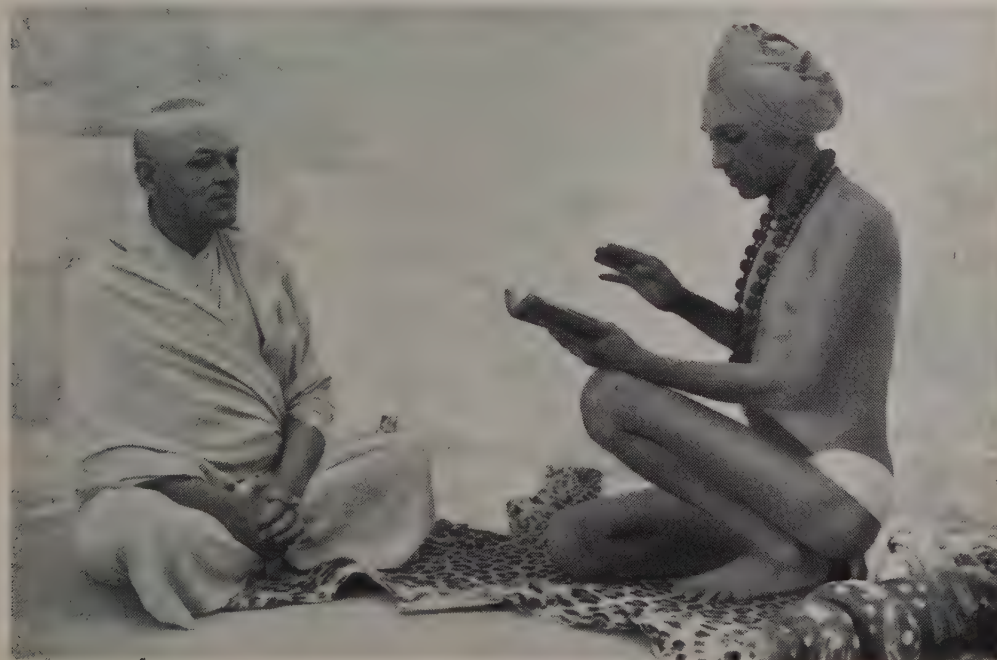
During the monsoon there is a great influx of sanyasis, some of whom are here seen taking an evening meal, while their spiritual chiefs wander among them repeating the names of God



Sometimes a pious citizen will entertain fifty or a hundred sanyasis at dinner, and will provide conveyance for the chiefs of the different orders



A group of pandas, Brahmin priests who act as guides and advisers to the pilgrims, performing a rite of their daily routine. Avantika affords a livelihood to over a hundred of these



A retired Punjab official (left) receives, as a novice, instruction from the Mahant or spiritual chief of the Naked Ascetics before joining the Order

As in Rome, successive ages have superimposed their monuments on the ancient sites of Avantika. This Hindu temple was reconstructed on the foundations of an earlier Jain temple



The flight of steps shown above leads down to a small temple pool of ancient design. The pavilion over the gate is occupied by the temple drums and drummers

found in great numbers along the banks of the Sipra. Some few of them have probably really hoped to further their 'cognition of God' by a wandering life of non-attachment. There is certainly a big percentage of sturdy, work-shy rogues among them, but there is no doubt in my mind that among these wanderers are also many who have chosen this vagrant life of destitution for the sake of essential peace of mind; as the only alternative, not to a life of work, but to a life of work inseparably associated with the harassment of money-worry.

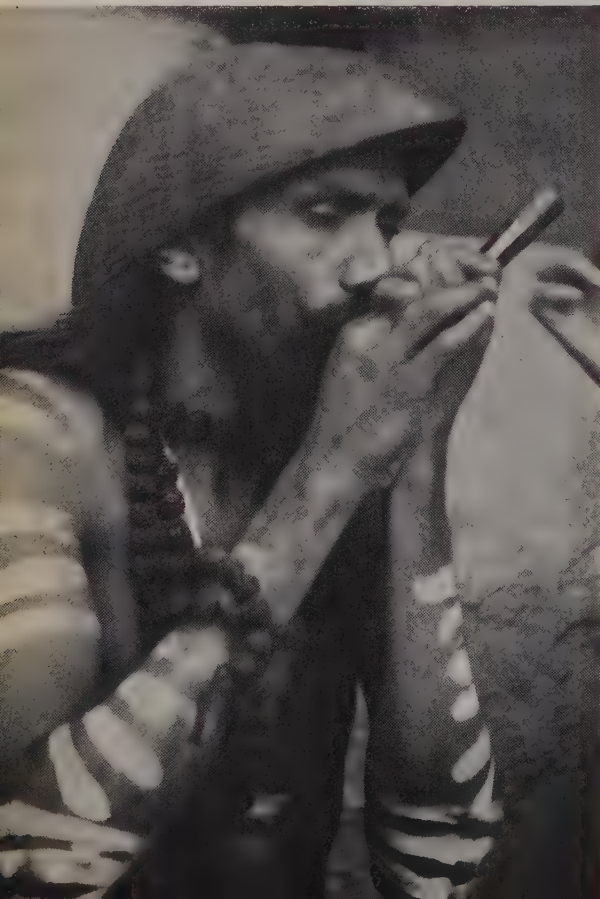
Among the groups of Sadhus I photographed on the Sipraghat was a care-free, healthy-looking young Brahmin. He started life, so I learnt, as a country school teacher on a monthly pay of twelve rupees (about eighteen shillings). He resisted the insistence of his parents to get married and found a family. When the twelve rupees were reduced to nine, he threw up his job, realizing that his services, like overproduced wheat or coffee, could not be sold at any economic price. Then he decided to seek deliverance from rebirth by wandering from Tirth to Tirth, that is, from one sacred watering-place to another. Now he wears only a rope and a rag, swims the sacred rivers half the day, and sings *bhajan*—lilting songs in praise of the gods—half the night; when the common pot is full he eats his fill; and he certainly looks quite healthy enough to digest the handfuls of uncooked grain he will usually receive without asking. Already he looked to me as if he had had some foretaste of deliverance!

The modern Hindu of the comfortable classes whom inherited wealth, or his own hard work or quick wits, have raised far above the grey poverty which is the general rule in India, has seldom a good word for the wandering Sadhu, and would like to see him regulated out of existence. While understanding his point of view, I do not share it. Believing that freedom is a good in itself, I am glad that it should be available at the price of complete destitution for

those who cannot afford it on other terms. The fact that this freedom is guaranteed by Hindu religion seems to me to be a valuable asset to Hinduism. As long as the wandering Sadhu may sleep out-of-doors

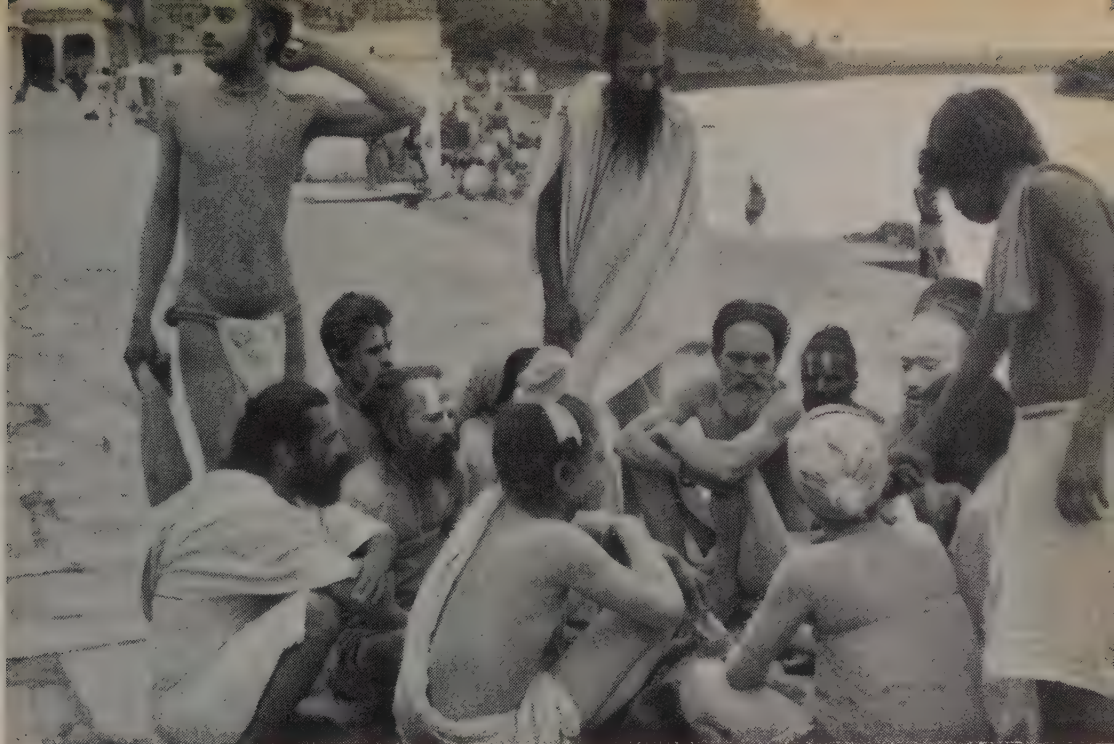


One of two dipa-stambha or 'columns of light' beside the Harsiddhi temple. The lamps are lighted at Devali, the Feast of Lights

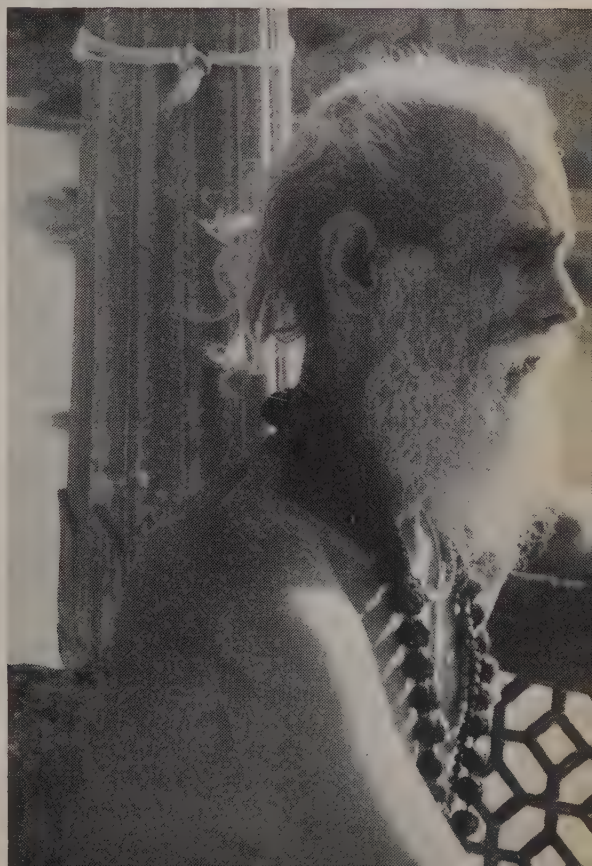


Sivaite Sadhus—'quiet men'—who belie their name by membership of a fighting order. Their necklaces are of rudraksha seeds, sacred to Siva in his destroying form of Rudra. Most of these wanderers are addicted to hemp, of which they are about to share a pipe, and which might be described as a mechanical aid to non-attachment

A Sivaite Sadhu of the same order, similarly engaged, finds his empty begging bowl useful headwear in the rainy season. On his arms and body are the triple bars of Siva



The senior member of a group of Vaishnavite Sadhus, seen seated on the right, has a white mask of ash on his face. Each group usually has several hangers-on, lay members of the order. They work their passage, doing the 'house-work' of these houseless wanderers: cleaning the pots and pans and lighting the communal cooking-fires



An aged Brahmin who, abandoning household cares, has chosen to share the freedom of the Sadhus and to spend his declining years in the practice of religion

without 'the price of a bed' on him, the right to the sky will be secure, in India at least, for all.

The acceptance of gifts is made easy for the wanderer by the doctrine of Hinduism, according to which the feeding of Brahmins and Sadhus forms an indispensable accompaniment of many Hindu religious rites, particularly of the *Shradh* or funeral ceremonies. For every Sadhu who visits Avantika there must be a hundred other pilgrims—orthodox Hindu householders. These pilgrims would be unable to perform their rites if Brahmins and Sadhus were not available in sufficient numbers. The orthodox Hindu makes his small gift to the Sadhu because it is his religious duty to do so. In consequence food sufficient to sustain life is free to the wandering ascetic—free, almost, as sunshine and river water.

The ranks of the wanderers in Avantika are swollen by many householders who, having reached middle-age, decide to withdraw from the world and to free themselves from all business and family concerns. Most of these have reached the retiring age and would be entitled to leisure even in a world where there was work for all. Probably the best human material among the sanyasis is contributed mainly from this source. Some of these retired householders, while leading the houseless life, have not taken *sanyas*: have not, one might say, taken the vows of the wandering ascetic. Among these is the old man whose portrait appears on page 33. He was my near neighbour during many weeks spent at Avantika, and his simple life—a life of scrupulous decency in outward things, in spite of extreme poverty—was lived before my eyes. Three times daily he took his ritual bath in the river, and washed the little cloth which was his only wear, according to the rites of his religion, and cleaned his two brass water-pots until they shone like gold; then, returning to his hut, he prepared his frugal food with meticulous cleanliness. He spent his long leisure hours happily, intoning the *vedas* (Hindu

scriptures), conversing with other wanderers like himself whom age and world-weariness had brought to Avantika.

To the non-Hindu who brings sympathy to the understanding of ancient Aryan rites of sun and water worship, the Sipra at the Ramghat will seem a model of what a Tirtha should be. If hospitable doors open to him, let him live beside the river, among the pilgrims. Before break of day the stentorian voice of one of the *pandas* breaks the night's stillness and will no doubt awaken the visitor after one or two repetitions. Let him then watch from his window. Even in November when dawns are chilly he will see many an aged Brahmin make his way to the river and take a leisurely bath and pray, standing waist-deep in the water facing the sun or sitting in silent prayer. The innumerable turtles of the Sipra prudently keep under water until it is warmer. The cows collect in places where the first slant rays of the sun will reach them soonest.

As before mentioned, the power of the State seeks to preserve the physical purity of this river, which near the Ramghat, at most seasons of the year and except after festivals, is sufficiently deep and clean to merit the enthusiasm even of visitors who come from countries where rivers are taken more casually than in India.

The non-Hindu visitor who swims to and fro along the first meridian, which crosses the river between the Ramghat and the Hariharghat, and sits sunning himself in the sweet November sunshine among the basking turtles on the further bank, will not begrudge a tribute of marigolds and small coins to the Sipra. He will perhaps remember Avantika as one of the pleasant places of the earth; but for the devout Hindu it has a deeper significance. Tradition has it that from this place the true pilgrim should start on his pilgrimage in the four directions: to Rameswar in the south, Dwaraka in the west, to Badrinath in the north and Puri in the east, and should then return to Avantika for *darshan*—the auspicious sight—of Mahakal.

Tristan da Cunha in 1937

by Officers of H.M.S. Carlisle

The islands of Tristan da Cunha are so remote that the advent of a ship, as the following article shows, is a major event in the lives of the islanders. Readers whose interest in this staunch little community is aroused will be glad to know that in a few weeks, or even sooner, the islands' chaplain, the Rev. Harold Wilde, M.C., will be returning to his people and that his return will be made the occasion for sending them some of the simple necessities that so rarely come their way. For this purpose a fund exists and is administered by the S.P.G., 15 Tufton Street, London, S.W.1. Contributions should be marked 'For Tristan da Cunha'

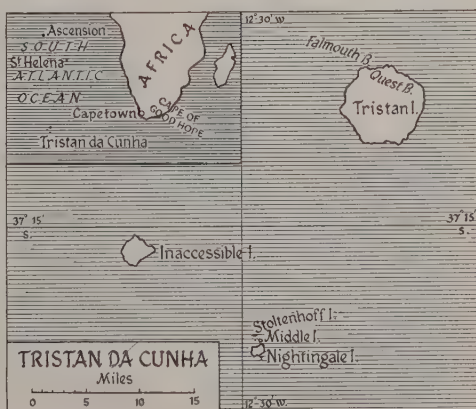
THE Tristan da Cunha group of islands lies in the centre of the South Atlantic Ocean just south of the latitude of the Cape of Good Hope. It consists of Tristan, Inaccessible, Nightingale, Middle and Stoltenhoff Islands, the last three lying close together about twenty miles south of the main island of Tristan.

It was discovered at the beginning of the 16th century by Tristan da Cunha, a Portuguese admiral then on his way to the East; subsequently it was visited at long intervals by ships of various countries until formal possession of it was taken, in the name of the British Government, on August 14, 1816, by a detachment of troops from the Cape Colony, as it was feared that French ships might water at the island during Napoleon's incarceration at St Helena. After his death the garrison was withdrawn, but one member of it, Corporal William Glass, a Scotsman, obtained leave to return to the island as a settler. He was accompanied by an Englishman, Peter Green, and was later joined by Alexander Cotton and Thomas Swaine, two seamen from the St Helena squadron of the Royal Navy.

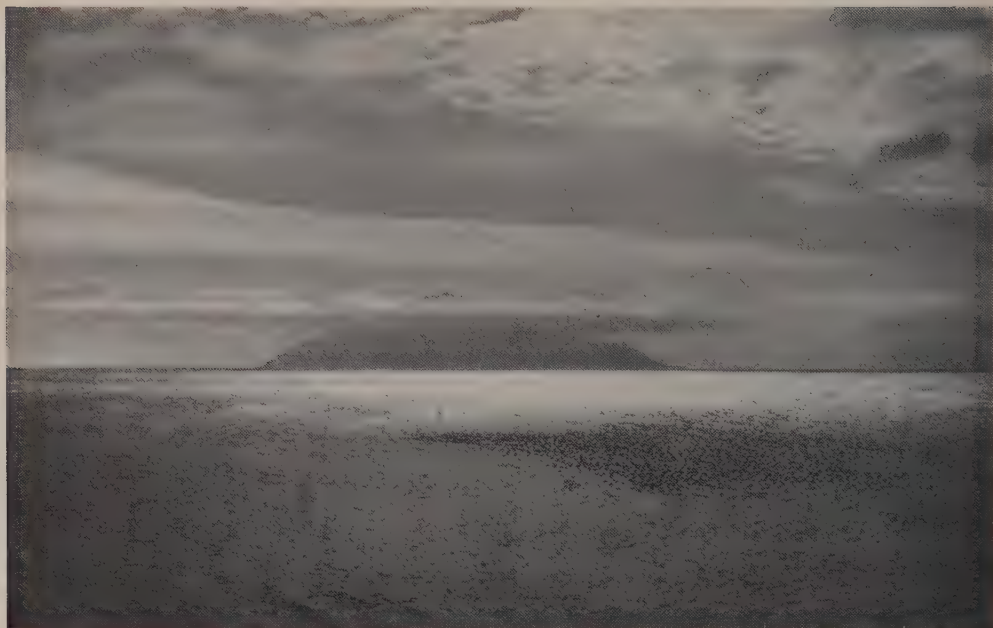
At first the settlement, named Edinburgh by Corporal Glass, was prosperous. Whalers and sailing ships frequently called at the island for water, more seamen joined the settlers and wives were obtained from home and from St Helena. The livestock which Glass had brought with him from the Cape flourished in their new surroundings and, with the potatoes and other fresh

vegetables which could be grown on the island, formed valuable articles of barter. In exchange, the islanders obtained from passing ships the necessities and luxuries which the island could not produce. But with the coming of steam at the end of the last century visits from ships became less and less frequent, until at one time five years elapsed without a single ship stopping to barter, and Tristan became known as 'the Island of Loneliness'.

The islanders, however, were not forgotten. From time to time the Society for the Propagation of the Gospel sent out missionary priests to instruct them and help them in their work. As opportunity offered the Colonial Office arranged for ships to visit the island with mails and gifts, and schemes for bettering the islanders' hard lot were considered. Then in 1934 the Rev. Harold Wilde, M.C.,



Stanford, London



Photographs by Officers of H.M.S. Carlisle

Tristan da Cunha is 2000 miles from the nearest mainland. In the age of sail, passing ships often called and traded; now sometimes years elapse without a single visitor

accepted the post of chaplain to the island, and under him great progress has been made. But the strain of living on the island is known to be great for the minister, and in the autumn of 1936 the Society for the Propagation of the Gospel asked the Colonial Office to arrange for a ship to call at Tristan and bring Mr Wilde to England for a rest and medical survey. By arrangement with the Admiralty a cruiser from the African Station was lent for this duty early in 1937.

On the morning of Tuesday, February 23, H.M.S. *Carlisle* left the Cape of Good Hope naval base at Simonstown to pay the first official visit to Tristan da Cunha since 1932. In addition to the evacuation of Mr Wilde, relief and research work had to be done, and the ship was filled to capacity with mails, stores, livestock and scientists.

Unusually fine weather was experienced on the voyage, and in spite of a small gale

on the Friday, always an unlucky day for seamen, Tristan was reached early on the morning of Sunday, February 28. The *Carlisle* anchored in Falmouth Bay just as the islanders were leaving church after their early service. It was a warm sunny day with a light south-westerly wind and, although a heavy swell was still running from the storm of the previous days, it was impossible to believe that this green island with the towering fern-clad cliffs was the loneliest inhabited island in the world.

In the north-west corner of the island the cliffs run down to a shelf some two hundred feet above the sea, the grassy slopes of which are the islanders' home. Here in an area some eight miles long and half a mile wide the life of the islanders is centred, for no other parts of Tristan are really habitable, though in some of the small sheltered coves round the coast apples and other fruit are grown in small quantities.



Only one eight-mile strip of land is habitable on Tristan; and here, on grassy slopes below towering fern-clad cliffs, the cottages of the islanders are scattered about

In the centre of this fertile area sturdy stone cottages are scattered at random round the white-painted church of St Mary. The houses are built of large, roughly fashioned, stone slabs collected from the foot of the cliffs, and are thatched with the coarse flax which grows profusely in the settlement gardens. Each house consists initially of a living-room and a kitchen, and other rooms are added as the family increases. The rooms are lined with board, and in the older houses, built when wood was more plentiful, there are also wooden ceilings. Newspaper cuttings, usually about the Royal Family, decorate the walls, but the floors are bare. Furniture consists of a plain table, wooden chairs, bunk-like beds and the inevitable cradle. There are few comforts, but the islanders are proud of their homes, which are their most treasured possessions.

As soon as the ship anchored the villagers were seen making their leisurely way to-

wards the beach. Time means nothing to them, for they have a long lifetime in which to grow potatoes, make love and die, and they take full advantage of it. They could not realize that we had only three days in which to unload stores and mail and complete our scientific and medical work.

Though slow, the islanders do get things done; before the ship had been long at anchor a boat was launched from the shore and, well handled in the swell, was soon alongside bringing Mr Wilde, who looked remarkably well after his long exile. The boat was one of two Board of Trade ships' lifeboats presented to the islanders by the Capetown Tristan da Cunha Society. Besides these two lifeboats there is a number of smaller boats made by the islanders themselves. Trees are scarce, and suitable wood for boat-building being unobtainable the islanders have shown much ingenuity in producing a fine type



Islanders rowing their chaplain, the Rev. Harold Wilde, out to meet a ship sent by the Colonial Office to relieve him after three years' continuous service on the island



H.M.S. Carlisle, which came to fetch Mr Wilde, arrived at Tristan on February 28, 1937



The scene of Mr Wilde's ministry. The cottages are built of large stones, taken from the foot of the cliffs, and thatched with the coarse flax which grows in the settlement gardens



The white-painted church of St Mary, centre of the islanders' life, with the storehouse beyond

of flat-bottomed double-ended boat which is used for fishing and all general purposes. The stem, stern-post and keel are made of some hard wood obtained in the past from wrecks or passing ships; the timbers, knees and breast-hooks are of twisted apple-bough, which grows on the island; and the whole is covered with a single thickness of sewn canvas. These boats, the largest of which are thirty feet long and have a beam of five to six feet, are light and seaworthy, but not sufficiently robust to lie with safety alongside ships in rough weather, and they are easily holed by striking the sunken rocks with which the coast abounds. A new boat was being built during our visit, but many of the older craft are unseaworthy, as canvas and nails are too scarce for all boats to be kept in good repair.

Arrangements for the landing were soon made. The Bishop of St Helena, in whose diocese the islands lie, and his temporary

chaplain landed in the island boat accompanied by a whaler from the ship taking the beach party and the islanders' mail. Other ships' boats followed with stores and provisions and, with the smaller boats from the island joining in the work, the sea soon presented a picture as memorable to the seamen as to the islanders themselves.

The stores were dumped on the shore in Quest Bay and taken the three-quarters of a mile to the village by half a dozen wooden ox-carts driven by boys too young to work on the beach or in the boats. Donkeys with panniers were used for carrying the small gear, and work proceeded at a steady, if dignified, pace.

The islanders are conventionally English. The men work hard when necessary, grumble when possible and would sell their souls for an extra ration of tobacco. The women do the housework and look after the men. In such a small community,



H.M.S. Carlisle was well laden with mail and provisions. These, with the aid of the islanders, were soon taken ashore, unloaded and dumped at Quest Bay to await transport to the settlement



Transport consisted of wooden ox-carts, driven by the younger boys who were not strong enough for heavier work. Lighter loads were carried by donkeys with panniers

still divided into the seven main families of Glass, Green, Hagan, Lavarello, Repetto, Rogers and Swain, it is surprising what goodwill and generosity exist. There is no scandal, little gossip and much real hospitality. The islanders, though sure that their own family is the best, work together for the communal good, and in all large undertakings—building a house or hauling up a boat—everybody lends a hand. Without speeches, money or trade unions they have achieved true communism.

As is natural in such surroundings, the inhabitants of Tristan have walked hand in hand with God from their earliest days. Each morning they rise with the sun and, on their way to work, call in at their church to ask a blessing on the labours of the day. Their chaplain is their guide in all things, spiritual and temporal. When he conducts a service or holds a meeting all attend, even children and babies. To

have been to one of their services in the tiny stone church, to have heard them sing 'God Bless our Homes' and 'Count your Blessings', and to have heard them pray that those upon the sea "may return in safety to enjoy the blessings of the land with the fruits of their labours" was a privilege none of us will soon forget. Theirs is true, practical Christianity.

The resident chaplain is also their postmaster and store-keeper. All through the first day of our visit stores and mails were arriving at the new storehouse behind the church, and there Mr Wilde and ratings from the ship were busy sorting and distributing. First they dealt with the personal mail, then with the presents addressed to individuals, and finally with packages for 'The Islanders'. All food and tobacco is kept in the storehouse, and rations are issued once a fortnight by the Padre. Before Mr Wilde's time, when a ship called with stores everything was shared

out; the inhabitants lived in plenty for a short time and when their luxuries were finished they reverted to the food of the island until the next ship brought relief. One of Mr Wilde's first improvements was the building of the storehouse, and now everything is carefully conserved; no one goes hungry, and a small reserve of luxuries (flour, salt and tea) is being accumulated.

The staple food of the island is the potato, which grows in large quantities in the patches some three miles from the settlement, and each house has a potato-shed attached where the family crop, some five hundred bushels annually, is stored. There have now been three successive good potato years, and the islanders have accumulated a surplus which, if opportunity offered, they would use for barter with the outside world.

Food of a kind is not really scarce. Fish and crayfish are plentiful round the coast, and young sea-birds and their eggs are seasonal luxuries. If well cooked the young mollyhawk is quite palatable; it is satisfying and tastes not unlike a rich Yarmouth bloater. The penguin is not so good, but her eggs are a great luxury.

Meat is obtained from the cattle which have wandered from the settlement and now roam wild in small herds at the southern end of the island. Like ponies on Dartmoor these wild cattle still belong to their hereditary owners, and once a year the young are rounded up and branded. At intervals a party goes by boat to shoot a few of these cattle, and the meat is distributed to the whole village. The cows at the settlement are used for dairy purposes only, and milk is the most usual drink in a community where tea is a luxury and alcohol is unknown.

Sheep are kept in large quantities (there are over seven hundred on the island) and are in good condition, though the introduction of new blood would much improve the breed. They are kept chiefly for their wool (from which the islanders make ex-

cellent stockings and shawls) and are only eaten at Christmas or on special occasions.

A few pigs, ducks, hens and a quantity of fine geese are kept, but are preserved for trading. Even the eggs are kept, as the islanders are determined that as far as they are able they will make themselves self-supporting and not be beholden to the charity of the outside world. The oxen, donkeys and a number of intelligent though unusual-looking sheep-dogs complete the list of Tristan fauna. The widely advertised rats of the newspapers are nearly non-existent.

To introduce the much needed new blood into the island stock the *Carlisle* had brought from South Africa a young pedigree Ayrshire bull, two pedigree pigs, a few pens of Rhode Island and Australorp fowls, and some ducks. The landing of these, especially the bull, formed the major task for the ship's boats on the first afternoon. Fortunately the sea was reasonably calm, and, secure in his crate in the stern of a cutter, the bull was landed on the beach without more than a slight surprise. A little stiff at first after his long confinement, he soon got used to his new surroundings. The rest of the farmyard settled down even more quickly, and at once occupied themselves in their various duties, the pigs searching for food and the ducks and hens waddling about laying their long-delayed eggs. It was a scene of great promise.

As it was advisable for various people from the ship to remain ashore to superintend operations, a naval camp was pitched on a grassy bluff between the landing-place and the village. Here during the first afternoon all the women and children gathered for inspection by the doctors. On previous visits medical officers had been struck by the fact that in spite of the inevitable intermarriage there was no noticeable deterioration, mental or physical, among the islanders. As might be expected in such a typically English community there is a village idiot,



But the heaviest item to be transported brought its own legs with it: a fine young pedigree Ayrshire bull, destined to improve the breed of island cattle. Stiff at first, from confinement in a crate, he soon perked up and surveyed his new kingdom





Besides the work of relief and supply, H.M.S. Carlisle's three-day visit had another purpose—that of medical and scientific investigation. A camp was pitched near the landing-place (above) to house the personnel for these various tasks. Concurrently with a dental inspection (below)—





—a medical inspection was conducted, for which the islanders assembled in force. Their excellent health may be attributed both to simple diet and to the habit of hard work: with them a slackening of industry is a sure sign of indisposition



The girls are comely and display a fondness for gay colours. In addition to cooking and looking after the men, they card and spin wool and knit woollen garments. They are clean and house-proud, conventionally English in their outlook and deeply religious



The old gun mounted by the garrison which did duty on Tristan while Napoleon was at St Helena. One of its members subsequently returned with three companions and founded the original settlement

but he is perfectly harmless, not much of a nuisance and, on occasions, a most useful worker. Apart from him the general standard of health is high; young and old have excellent physique, and, within the range of their limited experience, their mentality is well developed. They have a certain slow humour of their own, and although all the mothers believed us when we told them in turn that their baby was the fattest on the island, we could never be quite sure that they were not laughing at us too. A simpler, more loyal and grateful community it would be impossible to find.

The medical and dental inspections went on concurrently. The teeth of the islanders are a subject of special interest, as owing to the lack of edible luxuries they are almost perfect. Though the recent increase in the rations of flour and sugar have caused a slight falling-off since the previous inspection, in 1932, the general standard is com-

parable to that of the uncivilized Eskimo and is still much above that of similar communities elsewhere.

While waiting their turn for examination the families in their simple colourful clothes sat patiently in the bright sunlight, quiet and happy, presenting a scene irresistibly apostolic. At any moment St Paul could have stepped into their midst and neither they nor he would have been surprised.

All the time everyone else was busy; botanists and meteorologists climbing the cliffs in search of rare plants and altocumuli; engineers measuring the flow of water in the streams with a view to using them for electric power; agriculturalists examining sheep for scab and potatoes for blight; foresters choosing sheltered sites for the seven hundred young trees we had brought from the Cape; signalmen waving flags and trying to fire the old gun left behind by the original garrison; armourers

mending ancient rifles; artificers repairing the church harmonium; and sailors everywhere, handling stores here, riding donkeys there, sometimes a help, often a hindrance, but always good tempered and always welcome. The islanders will not soon forget them.

On the second day the ship's boats started a survey of Quest and Falmouth Bays, last done in 1816 by Mr Davis, Master of H.M.S. *Falmouth*. It was at once clear that the coastline had altered considerably, several points marked on the chart no longer existing, and an off-lying danger, the Julia Reef, having apparently never existed at all. The work was curtailed by bad weather, but sufficient information was obtained to redraw the map completely. Subsequent rough observations showed that Tristan Island, surveyed in 1852 by H.M.S. *Herald*, is smaller than shown, and that the other islands of the group are nearer Tristan than was previously supposed. Another addition we were able to make to the chart was the lighthouse which the islanders have built near the village to guide approaching ships to a safe anchorage. The oil-lamp in this small whitewashed structure burns nightly from sunset to dawn, and no matter how short of oil the islanders may be, sufficient is always kept for the light.

The second day on the island finished with evensong and a meeting in the storehouse. The house, which is also the school and village hall, is some fifty feet long and twelve wide. Into it were crowded the fourteen tons of stores we had landed and a hundred and eighty people of all ages. The windows are not made to open, and the meeting was held in a very homely atmosphere. Its object was to decide who should be head man of the island during Mr Wilde's absence in England, and after several of the islanders had spoken to thank the Padre for all he had done and avoided mentioning the main topic altogether, Will Repetto, the official choice, assumed office unopposed.

He already holds the King George V Jubilee medal, which was presented to him for the good work he has done on the island, and is a sound hard-working man. But outside guidance is needed, and Mr Wilde will be sorely missed.

During the last year, inspired by their pastor, the younger and more adventurous islanders had started a colony on Inaccessible Island. Mr Wilde was anxious for us to see their work. Accordingly at dawn on Tuesday, after a party from Tristan had embarked, the *Carlisle* weighed anchor. At Inaccessible, reached in just over an hour, there are imposing cliffs similar to those at Tristan, but the top of the island appears more like some English landscape, with valleys and rolling hills, and trees growing wherever they can get shelter



The rude lighthouse built by the islanders at Mr Wilde's instigation now appears on the chart revised by the officers of H.M.S. Carlisle

from the wind. The landing-place, in what is now called Carlisle Bay, is covered with pebbles and boulders and, as at Tristan, there is a stretch of kelp off the shore. The islanders put off in their boats when they saw the ship approaching, and came alongside as we lay to in the bay.

A small party from the ship landed to inspect the pioneer work done by these fourteen young adventurers. A hut and storehouse had been built close to the beach, and in front they had erected a flagstaff from which a Union Jack was flying to welcome us. The potato patches are close by on the only strip of soil below the cliffs, and here the party had been living their simple lives for the last six months developing and planting so that the resources of the group might be increased against the day when it will be



The Rev. Harold Wilde handling stores. Under his supervision a storehouse has been built and a small stock of imported supplies is maintained

possible for them to trade and barter regularly with the outside world.

Although in good weather the landing is easy, the interior lives up to its name; there is no easy way up the two-thousand-foot cliffs, and at present the settlement is limited to the very small strip at sea-level. The summit offers a good site for the proposed meteorological station. It is free from the layer of cloud which always hangs over Tristan; there is a magnificent waterfall which could provide enough power for any likely requirements, and the true wind can be registered without interference.

After a short time the shore party and the 'colonists' returned to the ship, and we hoisted their two canvas boats for the return passage to Tristan. Recently there has been some correspondence in *The Times* as to the suitability of small schooners for work between Tristan and Inaccessible. They would be quite unsuitable as there is no safe all-the-year-round anchorage for any craft in the group, and all boats must be capable of being hauled up on the beaches by the limited man-power available. A schooner for trading between Tristan and the Cape would, on the contrary, give the islanders those facilities for regular communication with the outside world which are so necessary for their well-being and encouragement.

On the way back to Tristan the opportunity was taken of closing the Nightingale Island group. These islands are entirely different from either Tristan or Inaccessible. The cliffs are low and there are attractive valleys and open spaces. But no attempt has yet been made to colonize the islands as there is no beach on which a landing can be made in any but the finest weather. Visits are only made during the nesting season when the weather is sufficiently favourable to allow the light canvas boats to be drawn up on the rocks. The islanders collect young penguins and eggs, but otherwise Nightingale is left to the vast quantities of sea-birds which make it their home. As a result the



Nightingale Island, 20 miles away, has no easy landing place. Nevertheless, having established a band of pioneers on Inaccessible, the people of Tristan hope to succeed in colonizing Nightingale

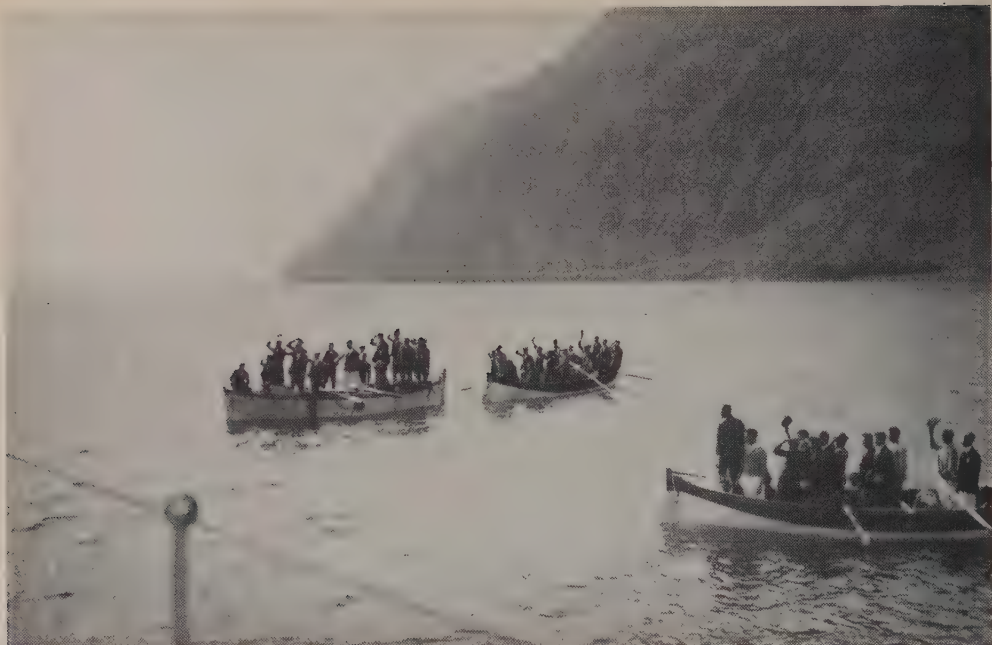
soil is extremely fertile, and when cultivated will yield a valuable addition to the produce of the archipelago.

As the *Carlisle* once again anchored in Falmouth Bay all work on the island stopped and everyone flocked to the beach. People so seldom leave Tristan for more than a short excursion to one of the other islands of the group that the welcome accorded to the returning 'colonists' after an absence of nearly six months was overwhelming.

As soon as everyone was ashore, the church bell was rung and the islanders assembled for the distribution of those miscellaneous packages of clothes, household utensils, childrens' toys and the like which are sent out by various benevolent societies. Each family, as nearly as possible, gets an equal share of these. Household goods were distributed first, and the women sat round on the grass nursing their babies while the Padre conducted his auction. The procedure was for each

article to be held up in turn with the question, "Who didn't have one of these last time?" After a moment's pause someone would hold up a hand, and then someone else. The Padre would pick out the right person, and repeat the procedure for the next article.

This, however, was too lengthy a business, and for the clothes a different method had to be adopted. Everything was sorted into piles according to kind—dresses in one pile, skirts in another and so on. Then all the women were lined up and each was given something at random from each pile. The same procedure was adopted for the children's toys and men's clothes. It was noticeable that although the women received an abundance, the men only got a few clothes, many of which were unsuitable. Morning coats, stand-up collars and stiff shirts were accepted without complaint, but warm jerseys and old tweed coats would have been more useful. There is a very real need on the



Farewell to H.M.S. Carlisle. The men of the island accompany their pastor to the ship and, with full hearts, give him a parting cheer

island for a supply of men's clothing of the right type.

The distribution finished about sunset, and after church and tea a dance was held to celebrate the return of the Inaccessible Island colonists. Once more a hundred and eighty people were packed into the storehouse; though many of the older men soon went outside to sit on the wall and smoke their newly acquired tobacco, dancing for more than a dozen couples at a time was impossible. Music was provided alternately by a gramophone playing dance records and an accordion rendering old-fashioned jigs. The islanders have never seen modern dancing and have evolved a jig step of their own which they adapt to foxtrot or waltz. As the evening progressed exhibition jigs were danced and the older men sang their stately sailing-ship songs to contrast with the landing

party's rendering of 'Red sails in the sunset' and modernized shanties. Eventually we were all sent to bed by the Padre.

Early next morning, after conducting a final service, the Bishop, his chaplain and Mr Wilde embarked. The farewell on the beach was most touching, every man, woman and child kissed their pastor goodbye before he could escape to the boat to give them his parting blessing. All the men accompanied him to the ship, and as we got under way they lay off in their boats and gave three cheers for him, the *Carlisle* and His Majesty King George VI.

This was the last we saw of a group of contented islanders who, with a magnificent leader like the Rev. Harold Wilde and more regular communication with the outside world, might well convert the Tristan group from the Islands of Loneliness to the Islands of Opportunity.

Tyneside

by G. H. J. DAYSH

New industrial undertakings have lately shown a disquieting tendency to establish themselves not, as social needs would indicate, in the North where older industries have suffered most, but in the already flourishing South. Happily the local life of Tyneside—a sample of whose vigour is the Geographical Society that celebrates its fiftieth anniversary this month—has withstood the years of neglect; and now that it is being revived with the help of projects like the North Eastern Trading Estates, we may hope that it will once more contribute fully to the national life as a whole. Mr Daysh, who is Head of the Department of Geography at Armstrong College, Newcastle, conducted the official Survey of the North-East Coast on which plans for industrial reconstruction are being based

To write the story of Tyneside is to write, in large measure, the story of the North-East Coast. Not entirely so, of course, for Wear-side and Tees-side have each contributed to the life of the area and played a notable part in its industrial development. Yet, when all is said, Sunderland and Middlesbrough on Wear and Tees respectively lack something of the historical picturesqueness and stature of Newcastle and the Tyne.

This corner of England, as often known as the North-East as by its county names of Northumberland and Durham, forms one of the most clearly defined geographic and, indeed, economic units of Great Britain. The sea to the east, the Cheviots and Pennines to the north and the west, were once its natural protection from harrying Danes and plundering cattle-thieves of Scottish and Cumbrian race; though, really, there was little to choose between these and the men of the Northumbrian border, who themselves bore the stamp of devil-may-care outlawry.

Throughout its industrial history the life of this area has been dominated by coal. As early as 1269 the monks of Tynemouth exported 'sea cole' to London, and by the 16th century a regular export trade was in existence. By 1703 exports of coal from the Tyne amounted to 48,000 chaldrons, or roughly 127,200 tons. Two hundred and twenty-three years later coal and coke exports to the whole world reached the stupendous figure of 13,315,214 tons.

The coalfield is confined to a triangle of

land stretching from the mouth of the Coquet to the Hartlepoons; thence inland to a point a little east of Middleton in Teesdale, and from there back to the Coquet. Though this triangle comprises only a quarter of the whole area of the North-East Coast, it contains some four-fifths of the total population. The rest of the region is sparsely populated, mostly by farmers and shepherds, who enjoy the freedom of the glorious dales and moorlands of Northumbria, as yet untouched by the blackened hand of industry except where some lead and other workings in the upper valleys have recently shown signs of renewed activity.



Stanford, London

The early development of the coalfield was due to the existence of a stratum of surface coal and the proximity of the mines either to the sea or to a river estuary. Even today, when the deeper seams are being mined further inland, there is no colliery more than some thirty miles from a shipment point. The comparatively recent mines in the south-eastern section of the coalfield are very close to the coast, and thus enjoy a great advantage over those of Yorkshire and Staffordshire. Though the Northumberland and Durham mines are within the oldest coalfield, exhaustion point has not yet been reached: competent authorities estimate that there are still some 7000 million tons to be won, which at the present rate of mining means a life of 150 years. Where, however, these coalfields have been placed at a disadvantage with newer pits is that most of their thicker and more accessible seams have been worked out. Other seams producing similar grades of coal have been opened up to take their place, but remote and deep mining in thinner seams adds to the costs of production.

But courage and enterprise have overcome even these disadvantages and have enabled owners to hold their own in a highly competitive market. Probably nowhere in England can one find such modern plant or such a high degree of electrification as in the collieries of the North-East. The Ashington Coal Company, for example, justifiably prides itself on being up-to-date in every way. The yellow-tiled buildings in their setting of green lawns and flower-beds suggest rather a modern factory for the production of cosmetics than a colliery. To see the great automatic electric winding-machine, as yet the only one of its kind; the electrically driven conveyors speeding the hewn coal to the washing and screening plant, which mechanically sifts the stone from the coal and separates the latter in sized lots down to a 2 m/m mesh; to descend the pit to the galleries, brightly lit by elec-

tricity, where men now work in a standing position with an electric hewer—a vast improvement on the crouching, muscle-wrenching discomfort of other days; to view these and the heterogeneous collection of automatic machinery, workshops, and laboratories, which all play their part before the coal reaches your cellar, is to realize that a modern colliery is no unworthy product of this mechanical age.

When, too, one can make this tour clad in nothing less abnormal than a white linen coat, and return to the pithead to breathe clean air and refresh the eyes with the immediately surrounding scenery of green trees and hay-fields unsmirched by grime or smoke, the charge against the mining districts of the North-East that they are bleak and cheerless seems to require modification. Nor does the modern colliery-owner confine his interest in clean conditions to the pit alone. In many places where the mining is the only industry, modern cottages with hot running water and electric light have been built by the colliery company for the miners' families. Playing fields and clubs are provided (though these largely come from the central welfare fund) and all modern collieries in the North-East are fitted with good bathing accommodation.

The North-East coalfield is noteworthy for the variety of the coal which it produces. Almost every grade except anthracite is to be obtained. The steam coals of Northumberland yield pride of place only to the richer seams of South Wales. West Durham produces the finest coking coal of any British coalfield, and, though the best has been mined, enterprise has shown that by washing and blending slightly inferior coals the demand for coking coal can be met for many years to come. East Durham produces chiefly gas coal of exceptionally fine quality and is the main source of supply for London and provincial gas companies, and even for gas companies abroad. The excellence of Newcastle house coal is proverbial, while



Ashington Coal Co. Ltd.

A pit-head at Ashington Colliery. 'Probably nowhere in England can one find such modern plant . . . as in the North-East.' The building on the left contains the special automatic winding gear



Ashington Coal Co. Ltd.

An electric hewer at work. The coal seam is undercut about four feet, then blown up



The drying-room for miners' clothes in the pit-head baths at Ashington. Each miner can hang his dirty, wet pit clothes on his own line, and then take a hot or cold shower in a room at the side

Edith Tudor Har

Durham bunker coals are to be found at all coaling stations on the ocean trade routes.

Although a reduced demand for coal has affected the North-East coalfields, the decrease has reached nothing like the serious proportions prevalent in South Wales. Today unemployment among the miners of Northumberland and parts of Durham has been very considerably lowered, and over 25,000 men have found re-employment since the bad years of 1932-1933. In South-West Durham, where pits have been closed down as they were worked out, a different problem exists, for here live entire communities who can never hope to find re-employment in pits which will never reopen. The problem of their tragic fate will not easily be solved: many

have been transferred to employment elsewhere and have borne themselves well in new trades; but one cannot transfer a whole population, and, in any event, labour transference is attended by many social difficulties. The suggestion has been made that the district should revert to agriculture, but that would not absorb a quarter of the unemployed. Meanwhile, they tend their gardens and allotments and enjoy such recreations and entertainments as social service has been able to give them. That, however, does not answer the call for work.

The North-East coast-line tends to be inhospitable and devoid of good natural harbours other than river estuaries. These, therefore, especially Tyne, Tees and Wear, have played an important part in its



Edith Tudor Hart

While the miners of the North-East are benefiting from better conditions of work, the outlook for women's health is also improving. Girls practising gymnastics at the Ashington Social Service Centre



Edith Tudor Hart

Edith Tudor Hart



Relics of an older industrialism: miners' cottages, now condemned, at Seaton Delaval near Blyth. The householders have at least the advantage of as much free coal as they can use

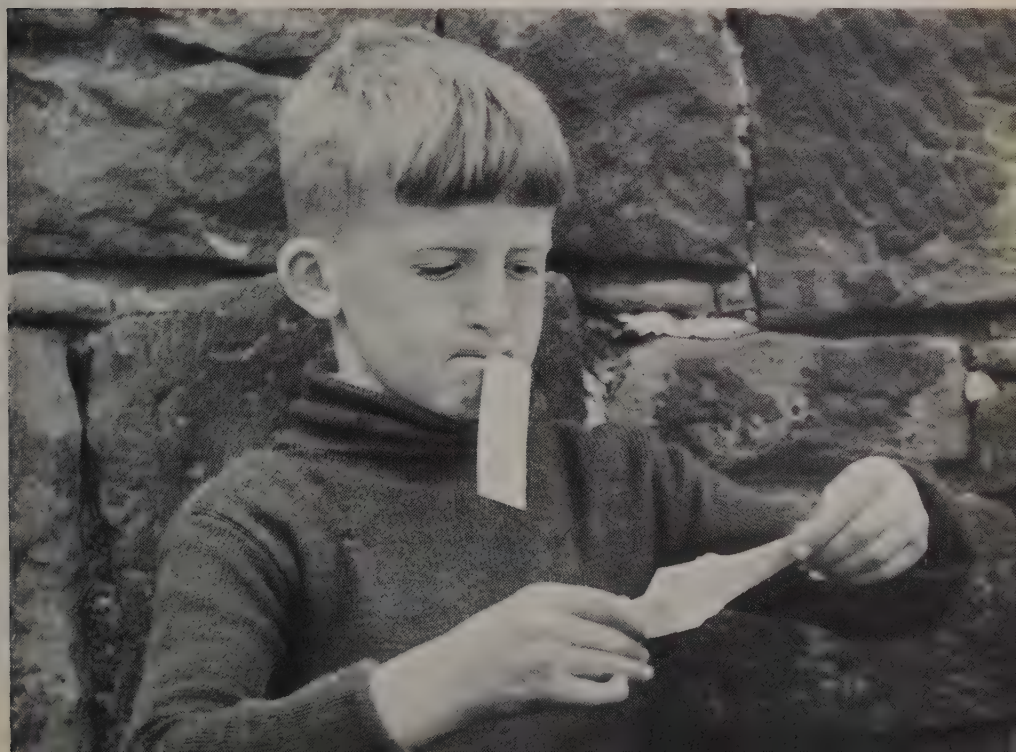
'The Tynesider most decidedly possesses a character of his own. He is humorous, though with a cynical touch. . . . None is more friendly to strangers, though he will not open his heart till he is sure of you.'



Edith Tudor P.

The North-Eastern stock, of which George Stephenson came, is as sound as ever it was, and the miners' children—given the opportunity—are no less likely than he to display enterprise and inventive skill. (Below) The first step: a paper aeroplane

Edith Tudor P.



economic life. Yet the Tyne as we know it today from Newcastle to the sea (as also the lower reaches of the Wear and Tees) owes as much to the skill and enterprise of man as to Nature. Eighty years ago the Tyne was a broad shallow winding stream with a narrow and uncertain sailing channel tracing its way between shoals and round numerous wooded islands. Though tidal for a few miles above Newcastle, the winding course of the river and the sharp bends obstructed the free scour of the tides and left a river, here rushing in a narrow channel with the speed of a mill-race, there flowing gently over sandbanks.

Such a stream was a great obstacle to navigation, which became even more difficult in the 19th century when the size of ships and cargoes steadily increased. At its mouth was a sand-bar with but six feet of water at low tide, the entrance exposed to the full force of north-easterly and south-easterly gales. Within the entrance the sailing channel showed barely four feet in many spots and, as a survey in 1813 clearly showed, the state of the river was becoming steadily worse. In 1850 the Tyne Improvement Commission was appointed to take over control, and from that time on a steady and marked improvement has been effected. The river bed has been widened, deepened and straightened. Portions of land jutting into the stream have been cut away; embankments constructed; and a scheme of deep dredging continuously undertaken. The river has been converted from a tortuous and dangerous shallow stream into a magnificent harbour over 14 miles long, deep enough and wide enough to enable the largest Cunarder or man-of-war to navigate with perfect safety, and fully equipped with every facility for handling coal, grain, oil and any other type of cargo. Since the Commission began its work, no less than 163 million tons of material have been dredged, the present annual amount being $1\frac{1}{4}$ million tons. The entrance has been protected by two

piers, one 2950 feet long, the other 5150 feet.

To Tyneside this improvement has brought world-wide trade. From Tyne-mouth to Newcastle a traveller by river will see the flags of every maritime nation discharging their cargoes in exchange for the coal and machinery which Tyneside sells. How many sailors of but eighty years ago recognised Newcastle as a port for anything but shallow-draft craft and barges? London, Bristol, Mersey, Clyde, Falmouth were the ports of call in old seafaring days. Yet in 1936 the imports and exports of general merchandise alone amounted to 2,418,686 tons, and the Tyne now ranks as one of the premier ports of Great Britain.

But Tyneside not only exports coal; it exports ships. Indeed, its reputation as a shipbuilding centre is as great as its reputation for coal, even though it does not go so far back in history. High tribute was paid to it by Defoe in the early years of the 18th century, when he wrote: 'They build ships here to perfection. I mean as to strength and firmness and to bear the sea.' Those, of course, were the days of sailing ships, in the building of which Sunderland also excelled and possibly had yards superior to those on the Tyne. Yet a place might excel in the building of wooden vessels and fail to maintain its position—as did so many American yards—when wood gave place to iron and steel, and sails to steam. For the shipyards of the North-East Coast the transition was comparatively easy. The advent of railways, and not least the genius of George Stephenson, led to the establishment of locomotive building on the Tyne. It was but a short step further to fit propelling engines to wooden tug-boats; experiments with iron vessels quickly followed, and in 1852 the building of the sc̄ew collier *John Bowes* by Palmers Yard established the reputation of Tyneside for iron ships. So rapid was the demand that by 1880 at least a dozen shipyards invaded the river-banks, and today only the Clyde can claim a higher place.



Since 1850 the Tyne Improvement Commission has steadily worked to convert the Tyne into a magnificent harbour. (Above) The piers protecting the entrance, together over $1\frac{1}{2}$ miles long (Below) One of the lower reaches, with the disused shipyards and steelworks of Jarrow on the right



Probably shipbuilding, more than any other industry, has conferred on Tyneside its reputation for engineering skill. Not only inventive genius (though in that respect Tyneside can hold its head higher than any single town in the world) but the innate skill of its menfolk in engine design and mastery of tools is responsible. Go to sea, and practically every good marine engineer you meet will be a Tynesider, if he is not a Scotsman!

The rapid development of these heavy industries dwarfed earlier established trades, such as glass, pottery and chemicals, which soon became economically negligible. A population of great density swarmed east and west along both banks of the river, until what are still separate municipalities have become geographically indistinguishable. From the river

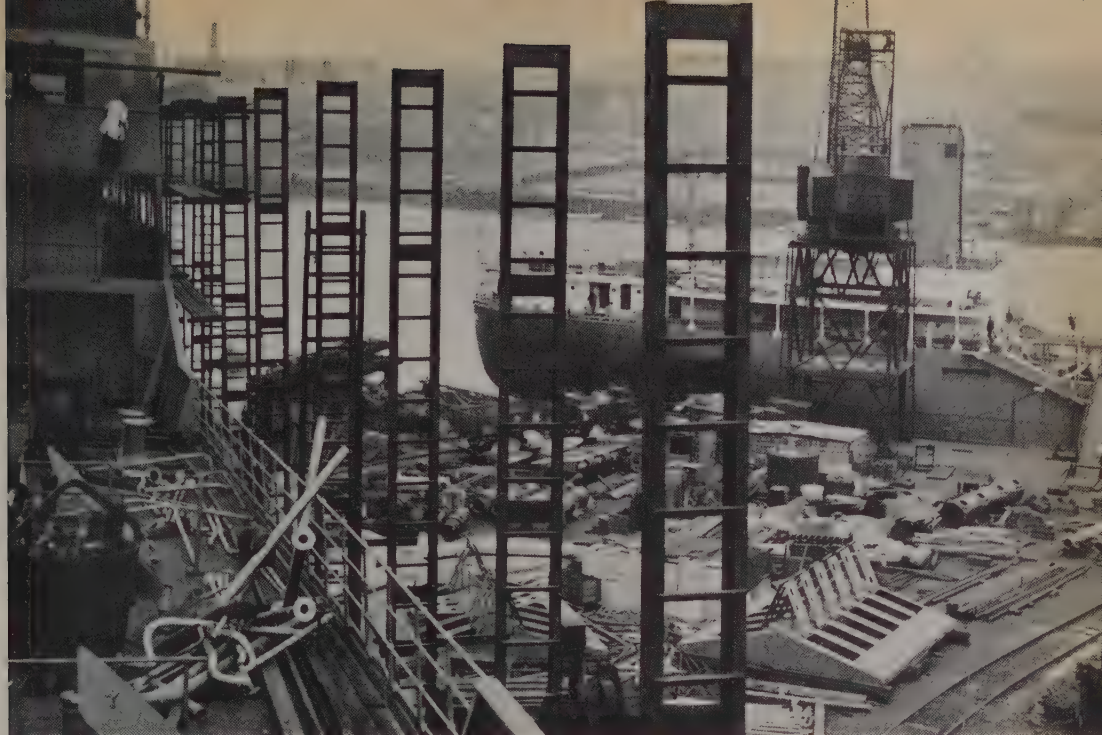
edge the houses have climbed up the steep slopes and in recent years have spilled themselves inland to form the villa-built suburbs of Newcastle and Gateshead. Here the congestion of houses and factories, so typical of the Victorian era, has to some extent been avoided, and it is the older smoke-blackened districts which have given to Tyneside a forbidding name. But even these offer an easier way of escape to the country than does the huddled monotony of the greater part of London.

For the Tynesider is more of a countryman than the Londoner, which perhaps is accounted for by the fact that barely two generations have passed since Tyneside towns were factory islands set in a sea of green fields. Even today Tyneside's greatest charm to many is the facility with which one can get out into the heart of



Edith Tudor Hart

The Tyne in the centre of Newcastle with its four bridges—that opened by King George V in 1928 and the low-level Swing Bridge, with two road-and-rail bridges beyond



Edith Tudor Hart

Edith Tudor Hart

'Probably shipbuilding, more than any other industry, has conferred on Tyneside its reputation for engineering skill.' Two views of the Neptune Works owned by Messrs Swan, Hunter and Wigham Richardson, who built the Mauretania at Wallsend lower down the river. Here the Annandale, an oil-tanker recently launched, is being fitted out





Edith Tudor Hart

The Tynesider's mastery of tools, in which he is second to none, has been exercised chiefly in the heavier industries. These, which suffered during the economic depression, have lately somewhat revived



Edith Tudor Hart

Bending a frame red-hot from the furnace, with the aid of clips known as 'dogs'



Edith Tudor Hart

Sturdy independence of character shows in every face among this group of Tyneside dockers, men of the older generation in whose youth employment was easier to find than it is today



Edith Tudor Hart

Young 'Geordies', who only ask a fair chance to show themselves as good men as their fathers



Edith Tudor Hart

With Government backing, the North Eastern Trading Estates, Ltd., are providing special facilities for the establishment of lighter industries in the Team Valley near Gateshead. A glass-bottle factory in course of erection for Messrs Houghton and Hall—8000 square feet; rental £300 a year

glorious country or onto grand sea beaches. At week-ends, hordes of short-panted cyclists, young men and girls, the product of this present industrial age, may be seen picnicking at the beauty spots of Northumberland. This, and the strong air of the North-East Coast, may account for the healthy vitality shown in whipcord muscle and glowing complexion. Football, of course, is the be-all and end-all of the Tynesider's winter life, and he still prefers using the ball to merely watching it. A favourite sport of the miners is foot-racing, while whippet-racing fulfils the dual demands of a love for dogs and betting. Miners are great gardeners; allotments and cottage gardens are prolific. A quaint

custom in this respect is the Leek Clubs, wherein there is rivalry to produce the largest leek; family feuds have arisen over nothing more serious, and the owners of this vegetable, though weary from long hours in the pit, will rise at midnight to tend their beloved plants.

Though there is little, if any, distinctive dress to characterize the 'Geordie' or his wife (unless it be the cloth cap and white silk scarf which are *de rigueur* on holidays or when out of work), the Tynesider most decidedly possesses a character of his own. He is humorous, though with a cynical touch; forthright and familiar—no cap-touching or 'sirring'—yet knowing when to obey. None is more friendly to

strangers, though he will not open his heart till he is sure of you. For a thickly populated industrial region, there is an amazing freedom from crime or vice. Though statistics are not available, the police court records show that here live some of the most orderly and decent people of England.

The Tyneside speech, even among educated people, is its most singular racial characteristic. Its sing-song cadence is reminiscent of a Scandinavian speaking English; many have said that it is the most beautiful dialect of the country, though others find its monotony jarring to the nerves. Real Tyneside talk is a language of its own, and no southerner and few educated northerners can ever hope to understand it. To listen to a group of miners, squatting Chinese fashion on their

heels, as is their custom, is to hear a foreign tongue.

These most likeable people suffered severely in the general economic depression, when the basic industries of coal-mining, shipbuilding, heavy machinery, bridge-building and locomotive manufacture fared far worse than the light industries of the Midlands and South. This was the more apparent because in the preceding years Tyneside had built up a population in excess of its capacity for industrial employment. Since 1935 it has been climbing out of the depths, and, contrary to general conception, this return to prosperity is by no means entirely due to rearmament, orders for which scarcely materialized until the beginning of this year. An increased demand for new merchant ships, railway material, bridges and



Edith Tudor Hart

Part of the works for the diversion of the River Team, which has been necessitated by the planning of this well-designed industrial centre, 700 acres in extent

electric power plant for overseas were the main causes of rehabilitation.

Even so, it had become apparent that the whole of the unemployed could never be absorbed, and the fear remained that this dependence on heavy industries alone was akin to putting all the eggs into one basket. A re-orientation of industrial support was required, and, with the assistance of the Government, a very real attempt is being made to attract to Tyneside the lighter forms of industry. These would not only preserve the area from wholesale depression during bad trade cycles, but would provide employment and additional family income among the extremely adaptable girls and juveniles.

The most ambitious and far-reaching of these schemes was the establishment last year of North Eastern Trading Estates, Limited. This company, financed by the Government, purchased 700 acres of land on the edge of Gateshead, which though on the verge of a large dormitory area is yet in the midst of beautiful country. On this site a modern well-planned industrial centre is being developed in close proximity to the main population grouping and to the main roads, railway and river which give it access to the markets of Great Britain. Those who once knew the placid Team Valley, after which it is called, are astonished to see the rapid growth of this factory garden. Here is sound planning allied with architectural beauty, in striking contrast to older industrial Tyneside. Almost daily the steel frames of some new factory spring from

the ground; and that the scheme is recognised as an ideal example of industrial planning is shown by the fact that over forty tenants have established themselves since first North Eastern Trading Estates announced their plans in October last. Many of these new industries have been aided financially by funds at the disposal of the Commissioner for Special Areas.

The advantages of such a development could be expounded at length, but what has been said about Tyneside will surely indicate them. Because it can now offer an unrivalled site for industry, it will earn a share in the industrial development of the post-war era. To say that the problems of Tyneside are solved would be both unsound and unwise. But at least one can say that, as regards unemployment, the condition of the region is far better than it was a short time ago. The recovery of the major industries; the continuance of numerous improvement schemes; the development of the Trading Estate, and many other activities, have given it new life, which is represented by a reduction in unemployment from 103,400 in March 1933 to 48,576 in May this year. This North-East, which combines glorious English scenery and historical romance with the labour and sweat that went to build England's fame and prosperity, deserves all that brains and money can give to it. Courage, enterprise and skill have never yet failed in the long run to succeed: those qualities are characteristic of the North-Eastern race.

A Visit to Putushan

by PAYMASTER LIEUT.-COMMANDER I. T. REES, R.N.



All photographs by I. T. Rees

Although barbarians of the East and West have sacked Putushan, the ancient equanimity of Buddha—

THE sacred island of Putushan is reputed to be the most beautiful in the Chusan archipelago, off the coast of China. Devoted solely to the Buddhist religion, its harbours within its monasteries the ancient Chinese culture that is elsewhere assailed by the disciples of Western civilization. Putushan was originally used as a resort for holy men about A.D. 967, but it was abandoned in 1387 on account of the devastations of the Japanese pirates. It was rebuilt in 1515, and in 1605 the Chinese Emperor interested himself in its repair. In 1664 the island was again pillaged by a party of 'Red-heads' who burnt all the sacred places. These red-headed pirates are reported to have been Europeans, probably Dutchmen. In 1668 it was again

rebuilt by the Emperor Kangshai, so the majority of the buildings are not of very ancient design; but that does not detract from their picturesque quality.

Putu island is outside the normal tourist route, and as it is the first piece of unspoilt China I have visited, I was naturally impressed. On first landing I was immediately struck by the air of peace, the absence of bustle and automobiles. There are no roads, only paved footpaths which interlace the island. At intervals the flagstones of the paths are carved with a lotus flower, a rose or some similar design. The only means of transport, other than walking, is a form of sedan chair made of basket-work and carried on bamboo poles by two coolies. These chairs are used by the higher



—and the deep-rooted strength of Chinese civilization have survived all vicissitudes of fortune





The walls of its monasteries enclose courts and gardens where the harmony of nature—





—and the art of man have combined to produce an atmosphere of calm geniality—

class priests. I myself weigh about 15 stone so did not care to entrust myself to the safe-keeping of these flimsy structures.

We were greeted with pleasantness and courtesy wherever we went. The priests and monks, who form about 95 per cent of the population, seemed to regard our visit as a break in the normal monotony of their lives. Whenever we visited a temple we were met by the Chief Priest, who conducted us round. In all the temples we visited—and we spent our time walking from one to another—our hosts seemed anxious that we should see everything, and before we left offered us tea and fruit.

Before we landed we were warned that we were not allowed to light any fires, pick any flowers, buy or sell any meat or fish or kill anything. The island abounds with wild squirrels and birds. In this connec-

tion I was interested while walking round the island to see a brilliant green snake on the path: it was about a yard and a half long. Happily on our approach it slithered away into the undergrowth, but I could not help wondering whether the party I was with would have remembered the 'no killing' laws of the island had the snake behaved differently.

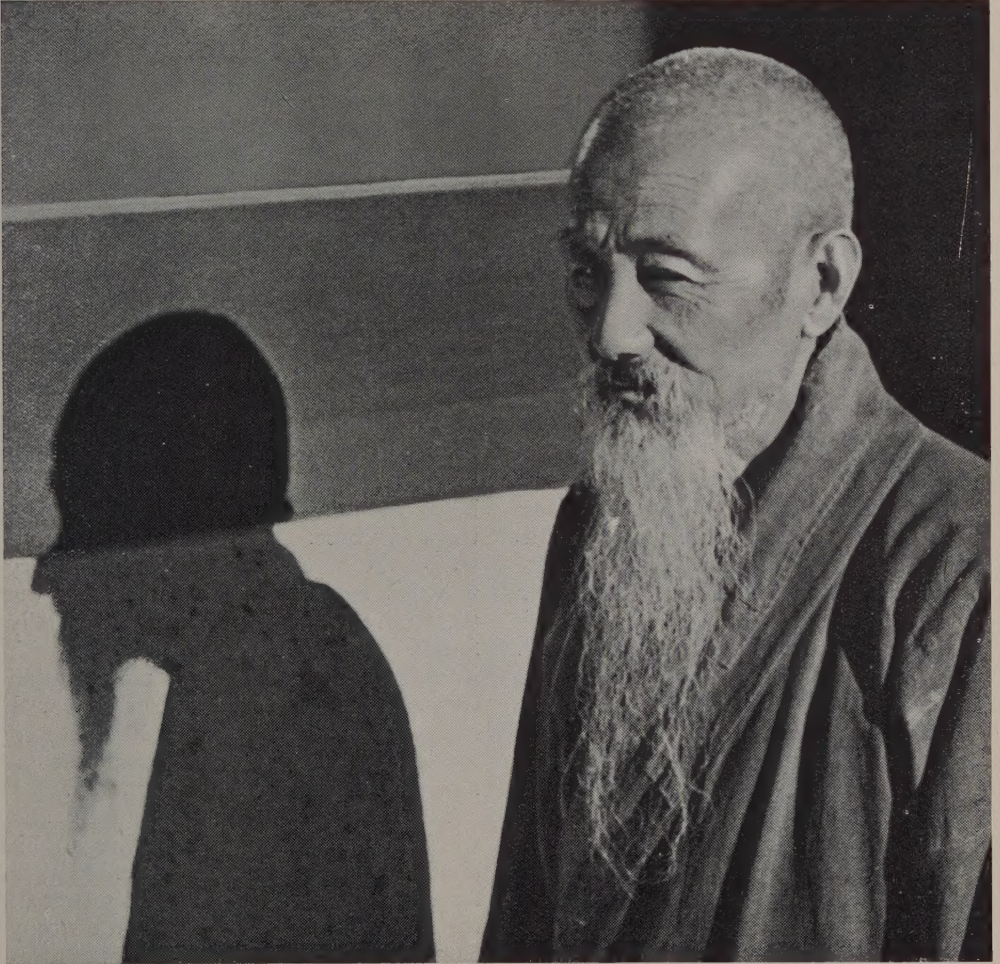
All the temples and monasteries that I visited were in exceedingly good repair, usually in far better condition than the well-known places of a similar type in Peking. The monasteries invariably had whitewashed walls, which contrasted delightfully with the Palace or Peking style roofs, whilst in some cases the walls were covered with luxurious bougainvillea.

The larger temples are in a compound enclosed by a wall about 18 feet high, and

in the case of the more important monasteries are approached by an attractive ornamental bridge which brings to one's mind the legend of the willow pattern plate. The compound contains the temples, probably two or three dedicated to the various gods and goddesses, and around the outskirts are the living-quarters of the temple staff, their kitchens, their workshops, their storerooms and primitive types of threshing machines where they grind their rice and corn.

In the centre of the island, near one of the most important monasteries, is a little village consisting entirely of shops. The shops appear to depend for existence on the pilgrim trade, although in addition to the replicas of sacred images carved in soap-stone and wood, the gongs, the candles and the 'joss sticks', you will find the local tailor, cobbler and bookseller.

At the northern end of the island is the largest monastery. It contains three large temples, the centre temple having a golden



—which is reflected in the philosophical and cheerful countenance of one of its priests



Bougainvillea cascading down a whitewashed monastery wall

roof, presumably due to association with a former Chinese Emperor. When you leave this monastery you are enticed by a circular gateway to another path, and as all paths lead to some temple you are tempted to explore further. This path appears at first sight to lead you to a leafy glade, but you are quickly disillusioned. Before you have gone far you come to a series of steps; these were counted by two of the fresher members of my party as we went up and came to a total of 1141. When we were half-way up, we met another party coming down; they said that they had just had three cups of tea and cheered us still further by saying that it was worse coming down. The weather was hot and we were all exceedingly thirsty by this time, but the thought of tea at the top—939 feet above sea-level—put new life into

us. Here we found two monasteries, though one is hardly deserving of that name, being the lighthouse with a small monastery at its base. The other is a large and well-built monastery, apparently very wealthy, as the silver ornaments in the temple are far above the standard usually found. Although we were received with interest by the monks, to our mortification we were not on this occasion offered tea. I can only assume that we must have arrived too late or that our predecessors had exhausted the hospitality of the monks.

There are no lighted streets in Putu, and when night falls everyone retires to his abode. The only audible sign of life is the faint monotonous chant of the priests at their devotions, mingling with the sleepy chatter of the birds and the incessant rasping and buzzing noise of the cicadas.

PHOTOGRAPHIC NOTES

Edited by F. S. Smythe

8. COLOUR PHOTOGRAPHY (1)

Up to 1861 there were numerous theories as to the nature of colour, many of which were described by their originators in an entertaining and, in the case of Goethe's *Farbenlehre*, poetic and literary manner. In 1861, however, Clerk Maxwell demonstrated that all natural colours can be simulated by mixing various proportions of the three primary colours, red, green and violet. In order to demonstrate this, Clerk Maxwell carried out the first recorded example of 'additive' colour photography. He photographed a scene three times through filters transmitting the three primary colours, and obtained three negatives. From these positive transparencies were prepared which were projected at the same time and in register through the three filters; red, green and blue. In this way a coloured picture of the original scene was obtained on the projection screen and Clerk Maxwell's conception of colour was finally accepted by the scientific world as proven.


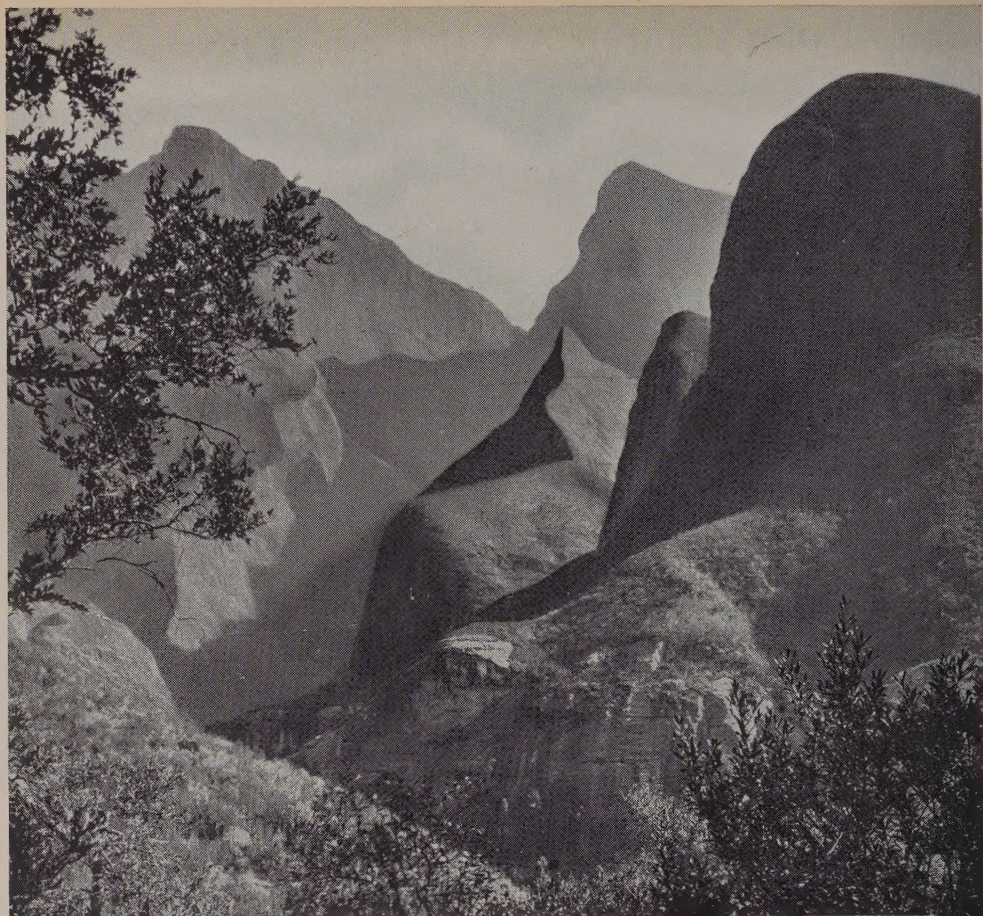
This same principle of the tri-colour rendering of a picture was later adapted by the printing trade for the reproduction of coloured pictures by the three-colour half-tone process still widely used today. A half-tone block, however, prints the shadows and leaves the highlights, so that each of the three blocks has to be inked in the so-called 'minus colour' of the filter used in making the original negative. For example, using three filters, red, green and blue-violet, three prints are obtained from which three blocks are made. The block of the red filter picture is printed in the colour which was absorbed by the red filter and had no effect upon the film—*i.e.* blue. Blue in this case is therefore described as 'minus red'. In the same way the green filter picture is printed in 'minus green' or magenta, while for the violet picture 'minus violet' or yellow ink is employed. Thus the actual use of the filter in each case is to subtract from the photograph the colour in which it is going to be printed. This method of reproduction is therefore known as the 'subtractive process'.

Subtraction of colour is the principle followed by nature. An object only appears red because all the other colours of the spectrum have been absorbed, the red alone being reflected—the green and the violet

have been 'subtracted'. An important milestone, therefore, in the history of colour photography was the conception by Mannes and Godowsky of their subtractive projection process for cine-photography which proved exceptionally workable; it was finally perfected in America in 1935 and introduced into this country last year.



A set of colour separation negatives and prints taken through red (top), green (middle), and violet (bottom) filters



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